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The next Annual Meeting of the Massachusetts Medical Society will be held at the Hotel Statler, Boston, on Wednesday, Thursday and Friday, June 8, 9, and 10, 1932.

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The New England
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JACKSONIAN ATTACKS AND BRAIN TUMOR*

BY E. W. TAYLOR, M.D.†

AMONG the early diagnostic indications of brain tumor, epileptiform seizures of whatsoever character should be given a prominent place. The following case, with others more briefly reported, is presented to emphasize this fact and to draw attention to certain difficulties in diagnosis and to possibilities of treatment.

M. R. G. a furniture salesman by occupation, 41 years old, was referred to me July 6, 1931. He had been married twelve years and had had no children. In 1917 while in war service he was inoculated for typhoid. The day after the second inoculation he was found unconscious and taken to a hospital. No details were obtained of the exact character of this attack beyond the fact that he is said to have been "cold and shivering" and was unconscious. He underwent a third and fourth inoculation without untoward results and continued in the service. He had a second attack a year later and several others while in France, the details of which are not known, but this apparently in no way affected his efficiency. After the war he was active in his business affairs and up to the time of his last illness was able to carry on effectively, and to conceal for the most part the increasingly frequent attacks about to be described, which he continued to have. No definite history of convulsions at any time was obtained although his wife thought that at the beginning the attacks were decidedly more general in character than later and in some instances were accompanied by convulsive movements. It is certain that general epileptiform attacks, if they ever occurred, had given place to others of different type. He had had at no time definite headache although toward the last he had had some vague head discomfort. There was likewise no nausea; his sleep had not been disturbed and his general health was in no way affected. His wife, however, had noticed that of late there had been a certain change in character, that complications which had never before occurred had arisen between them and his family, that his devotion to his mother which had always been a marked characteristic had increased to the extent of making him rather neglectful of her. He felt on the other hand that his wife was difficult and unsympathetic which apparently was an entirely incorrect appreciation of the situation.

At the first visit he had six or seven attacks, each lasting approximately from 30 to 45 seconds, of the following character:—His manner became abstracted, he stopped speaking and in a few seconds a pronounced twitching of the muscles about the right side of the mouth came on involving finally the entire facial distribution on that side. He sat perfectly still during the attack and appeared to be in no distress. After a half minute or so the twitching ceased and he quickly became normal again except that his speech immediately after the attack was confused and for a time difficult to understand with, however, no persistent aphasia. His pulse was in general not raised and in fact was rather slow, registering 60 or thereabouts. He insisted, although he could not speak, that he was not unconscious at any time which was easily demonstrated by asking him questions at the height of the attacks which he answered correctly by nodding his head.

From this time on, while he was under observation, he had constant attacks, as many as twenty or more a day and his wife was under the impression that they were getting more severe. The attacks came on while he was standing as well as sitting, usually with some slight warning which, as suggested above, permitted him to take measures to avoid being observed.

He was admitted to the Baker Memorial Hospital on July 10 and during his stay of twelve days there, with some remissions, he had, on the whole, increasingly severe attacks always absolutely limited to the right side of the face. At one period he had the attacks at approximately ten minute intervals, often in a series followed by remissions for a considerable time, very possibly due to temporary exhaustion of the nerve.

Physical examination, July 6—Pupils equal, normal in size, circular in outline; light reflex normal; accommodative response normal; fields normal; fundus normal (frequent subsequent examination of the fundus at no time showed the slightest sign of swelling or pathological changes in the discs); vision unaffected. There was no nystagmus; hearing normal with positive Rinné test; other cranial nerves negative except for the periodic spasmodic movement in the right facial distribution; tongue and throat normal; arm reflexes equal and normal at elbow, wrist and biceps. There was no ataxia; both motion and sensation were normal; strength by the dynamometer 95 right, 80 left; leg reflexes equal, knee jerks normal; Achilles normal; no clonus; normal plantar; no Babinski; Romberg normal; sensation and motion normal; position sense unaffected; gait normal; no tremors.

Laboratory investigations at the hospital:—Urine negative. Blood 4,850,000 red cells; 5,100 white cells; smears and differential count normal. Stools negative. *Lumbar puncture*—initial pressure 260, fluid clear, colorless; seven lymphocytes; ammonium sulphate +; alcohol ++; total protein 36; sugar 62.5; chlorides 740; Gold sol 0000000000; Wassermann negative in blood and spinal fluid. A ventricular air injection in sitting position after 65 c.c. of fluid had been removed showed the subarachnoid spaces and ventricles fairly well filled; the lateral ventricles deformed and markedly displaced with evidence of pressure on the left side. There was more air in the subarachnoid spaces in both parietal regions than normal. X-ray showed an area of calcification about 1 cm. posterior to the left coronal suture and about 3 cm. from the mid-line. The most definitely outlined portion of this calcified area was 1 cm. long and ½ cm. in width. Another area of density seen only on the stereoscopic films appeared to extend from this area of calcification downward to near the temporal bone. It had indefinitely de-

*Read at a meeting of the Boston Society of Psychiatry and Neurology, January 21, 1932.

†Taylor—James Jackson Putnam Professor of Neurology, Emeritus, Harvard Medical School. For record and address of author see "This Week's Issue," page 812.

fined margins. The blood vessel markings of the skull were apparently normal except above the right orbit where there was an unusually large "venous lake". The sella was normal and there was no positive evidence of chronic increased intracranial pressure. The opinion was expressed by the X-Ray Department that the small dense area described above probably represented calcification within a tumor displacing the ventricles. The tumor was regarded as probably a subcortical glioma.

On the basis of these findings operation was decided upon. On July 21 Dr. W. J. Mixter made a large osteoplastic bone flap over the left frontal region under avertin anesthesia, disclosing a considerably distended brain without pulsation and a rather bulging dura. The blood pressure was high during the operation, 200, later sinking to 150. There was considerable difficulty in controlling hemorrhage. The dura was incised, the cortex appeared normal except for an area apparently 2 cm. in diameter (later found to be much greater) in which the surface looked slightly granular and suggested tumor. On probing this area Dr. Mixter felt sure that he detected a hard underlying mass. No attempt at removal was made. The patient was returned to the ward in fairly good condition but did not rally and died the following night in spite of a blood transfusion.

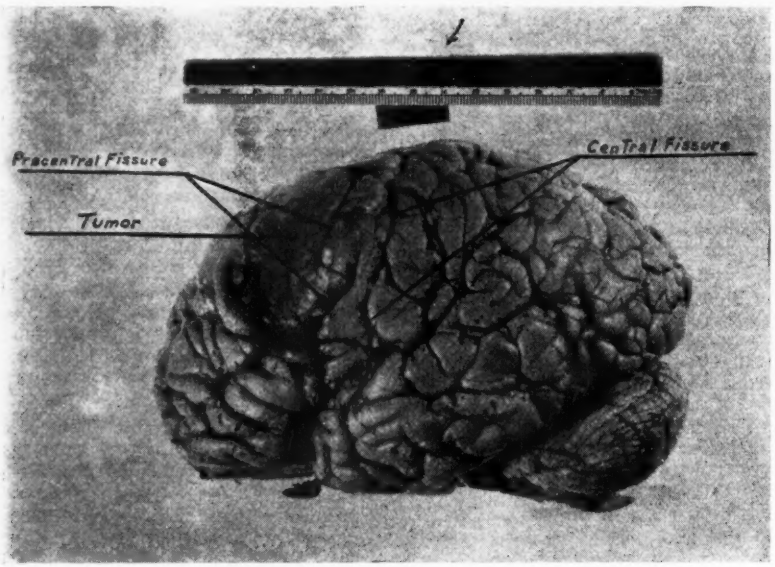

FIG. 1. Tumor, involving chiefly the second frontal convolution, not invading the ascending (motor) convolution, excepting possibly at its lower part.

Necropsy by Dr. Charles S. Kubik, to whom I am indebted for the following notes:—Apart from a persistent thymus, weighing 16 grams, pulmonary congestion and a dilated heart, the general examination was negative.

Brain—Left frontal craniotomy with bone flap. A small amount of soft clotted blood on the outer surface of the dura. In the left posterior frontal region of the brain there is a firm mass the surface of which is exposed or possibly covered by a thin layer of cerebral tissue. This outer surface is a rounded, slightly raised area 7.5 cm. in diameter and has the appearance of exceedingly broad, flattened cerebral convolutions separated by very shallow fissures. Its upper border comes in contact with the superior frontal convolution and displaces it towards the median line but does not actually invade it. Posteriorly it extends to and probably into the anterior central convolution while its lower border is situated 1.5 cm. above the Sylvian fissure. The anterior border is about 5.5 cm. back of the frontal pole. No nodules are seen or felt. Cut surface of the superficial part is homogeneous, pale, possibly slightly yellowish and rather firm. Specimen hardened in formalin without sectioning.

After fixation, horizontal sections were made a little below the centre of the lesion and about 1 cm. below that, the latter being situated about 1 cm. above the inferior frontal fissure and passing through the lower part of the lesion. The transverse diameter of the left frontal lobe is 7 cm. in its widest part; of the right 5 cm. The anterior horn of the left lateral ventricle is flattened and displaced backward and to the right. The lesion measures 4-5 cm. in diameter. Its cut surface discloses several pale, rounded, areas from 0.5 to 1 cm. in diameter which are surrounded or separated by rounded, irregular cavities filled with pale, web-like tissue and by areas of pale, soft, spongy tissue. The lower portion of the left middle frontal convolution shows many minute cavities, less than 1 mm. in diameter. The largest and most conspicuous of the pale, rounded areas is situated 4 cm. posterior to the frontal pole and 1 cm. from the mesial surface. The cut surface is whitish in color, has a homogeneous appearance and its consistency is about that of normal white matter. A small area in the centre is grayish in color, softer and particularly granular. At the bottom of one of the fissures (probably left inferior frontal) there is a rounded area of dark clotted blood 0.4 cm. in diameter which appears to be in the lumen of a large vessel but may perhaps be in the pia-arachnoid. The outer part of the lesion appears to be limited almost entirely to the posterior half of the left middle frontal convolution which is much broadened. The left superior frontal convolution is flattened and displaced inward and there is probably slight downward displacement of the inferior frontal convolution. Distance between left superior and inferior frontal fissures measured across the centre of the lesion is 7 cm.; corresponding measurement on the right side is 5 cm. The left anterior central convolution is displaced backward and the anterior margin of its lower portion may be involved in the lesion. The latter extends inward involving the white matter and in its widest diameter approaches within 1 cm. of the mesial surface of the left frontal lobe. It does not seem to involve either basal ganglia or internal capsule but must come very near the caudate

nucleus. In many places there is a distinct line of demarkation between cortex and underlying, presumably pathological, tissue. At the bottom of one of the smaller fissures, apparently subpial there is a group of fine brownish, calcareous granules in an area about 0.3-0.4 mm. in diameter.

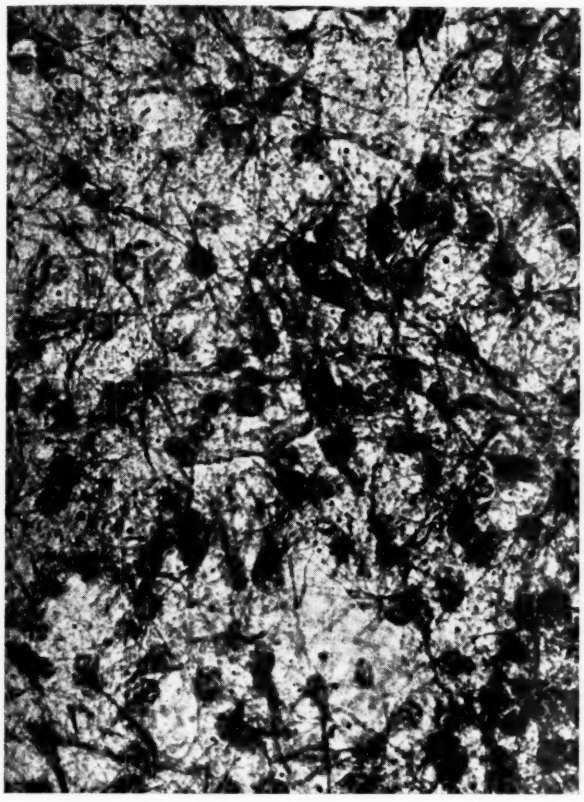

FIG. 2. Astrocytoma, fibrillary type, Holzer stain, high power. (Kubik.) Characteristic cells of the tumor.

The lesion of the left frontal lobe is a fairly cellular tumor composed of cells with rounded nuclei and scant cytoplasm scattered through a rather dense structure of glia fibrils. The appearance of a phosphotungstic-acid preparation resembles, except for cellularity, the gliosis of a degenerative process; most of the cells have no demonstrable cytoplasm and are seen as nuclei lying among well-stained, wavy, deep blue fibrils, which in many places are arranged in narrow longitudinal bundles. A few cells have one or two, occasionally more, tail-like processes. Sometimes fibrils swing or bend around nuclei giving the impression that they pass through glia cells but for the main part the nuclei appear to lie free in the fibrous structure. The nuclei resemble those of normal astrocytes in size and staining reaction. Multinucleated cells are rare. No mitotic figures are noted. Except for a comparatively small number of blood vessels there is no stroma. Adventitial connective tissue is not increased in amount. Some of the blood vessels are surrounded by small round cells which resemble lymphocytes and in some cases by a few fat corpuscle cells. The tumor contains a number of small degenerated areas and small cavities, the latter being partly filled with lightly stained structureless amorphous material. In one place there is a group of irregular shaped calcareous deposits. There is no sharp line of demarcation between tumor and brain tissue. At its margins the tumor cells are less numerous and eventually merge with and are lost in the surrounding gray and white matter.

Diagnosis—Astrocytoma, fibrillary type.

There are a number of points of rather special interest in this case, first, the onset and its possible relation to an anti-typhoid inoculation; secondly, several severe, probably general, epileptiform attacks at the outset, followed for a number of years by sharply localized spasms without loss of consciousness in one facial nerve and without extension to other parts of the body; thirdly, the complete absence* of signs pointing toward intracranial pressure, in spite of the presence of tumor; fourthly, the entirely normal mental state, except for a possible slight character change; and fifthly, unexpected death following operation.

Inasmuch as he was twice inoculated under similar conditions after the onset of the original attack and the necropsy showed tumor, the relation of the primary seizure to the inoculation may be dismissed as a coincidence merely. Regarding the second point, it is difficult to explain why with a growing tumor the attacks should have become milder and more localized in character, nor is it easy in the light of the necropsy findings to see why the final Jacksonian attacks should have been so sharply confined to the face, since the tumor apparently lay in equally close proximity to the arm area. Even more remarkable is the fact that throughout his long illness of fourteen years no general signs appeared even faintly suggestive of intracranial pressure. He had at no time headache, vomiting or changes in the discs so far as known.

In the light of the ultimate findings, it appears that more stress should have been laid on the character change as suggestive of frontal lobe involvement. His wife stated that his attitude toward her had markedly changed, that he was irritable and inconsiderate, and that he appealed to his mother rather than to her when difficulties arose, which had not before been his habit, although he obviously had a rather strong mother fixation, evidently, as events proved, increased or reënforced by his disease. Finally his death remains unexplained following an operation without complications and in which there had been practically no manipulation of the brain, other than ventricular puncture, puncture of the tumor and removal of a bit of the cortex for diagnostic examination. The fact that occasionally death may occur under such conditions should make us guarded in our prognosis regarding apparently uncomplicated operative procedures.

CASE 2—Admitted to the M. G. H. Neurological Service, July 2, 1929. He had previously been at the Lahey Clinic for a supposed gastric ulcer which was not confirmed and later saw Dr. H. C. Solomon who made a tentative diagnosis of multiple sclerosis, his opinion being reënforced by a paretic goldsol curve. The patient had had a variety of

*Spinal puncture showed a slight increase in fluid pressure a few days before operation.

transitory symptoms strongly suggestive of this diagnosis the first of which was a pronounced weakness of the legs. On May 15, 1929, he had an attack in which he fell forward on the floor, his mouth twitched but he does not know whether he had a general convulsion. Three weeks later he had what he described as "a tight feeling" in the left arm and a sensation of heat in the hand lasting for ten or fifteen minutes. He had found it difficult to put his hand in his trouser pocket or properly to control its movements. In addition to this, —the matter to which I wish to draw particular attention, he had had a number of Jacksonian-like attacks involving the left face. Further study made the diagnosis of multiple sclerosis doubtful; a tumor was suspected. A ventriculogram showed on the right an air-filled space 1 cm. in width with apparent retraction of the brain substance. The ventricles were normal in position and contour. Wassermann reactions were negative as was the general physical examination. From the onset of his first symptom,—weakness of the legs, the entire duration had been fifteen years. An examination recently made disclosed nothing on the physical side beyond a definite, although not very pronounced, astereognosis of the left hand with a distinct diminution of sensation over that hand and lower arm, together with definite weakness of the arm. The dynamometer showed approximately half the strength on that side as compared with the right hand. There were no signs whatever of increased intracranial pressure.

This case, like the preceding one, apparently began, so far as the cerebral symptoms were concerned, with a seizure associated with unconsciousness, later assuming a Jacksonian type. It is, of course, impossible to say just what the mechanism underlying this situation is and multiple sclerosis certainly cannot definitely be excluded, but in view of the ventriculogram and the present fairly sharp localization to the right arm area and the subjacent sensory cortex, as indicated by the astereognosis, the condition brings up the question of operative exploration. The evidence of tumor is slight in the absence of all signs of intracranial pressure which, however, was precisely the situation in the patient whose history I have described in detail.

On the whole, operation would appear to be entirely justified in this case although the probability of relief is rather small and the possibility of rendering the condition worse not to be minimized.

Case 3*—The unfortunate result of operation on the left side is illustrated by the following case, although in this instance, in any event, the ultimate outcome would have been fatal. The patient was a man of 35 who for upwards of three years had suffered from epileptiform attacks. For several years he had been treated for "essential" epilepsy and for a year after he fell into my hands no other diagnosis was made. Finally a double choked disc, greater on the right, established a diagnosis of tumor, the location of which was, however, difficult to determine. It was before the days of the encephalogram and the x-ray had not been perfected. It appeared, however, that in the epileptiform attacks, which were general, there was a predominant involvement of the right arm. He was operated upon by Dr. F. B. Lund by an osteoplastic flap over the left mid-frontal area. Lumbar puncture had not at that time been generally employed for the relief of tension after opening the skull and there was considerable postoperative herniation. Following the operation there was a practically complete aphasia of the so-called motor type whereas before the operation there had been no disturbance whatever in speech. He lived for six months and was decidedly relieved of his symptoms of headache, vomiting and epileptiform attacks. He at no time developed a paralysis of the arm or of other parts of the body but, as stated, the aphasia persisted.

The *necropsy* disclosed a tumor at the base extending upward combined with a periosteal cyst connecting with the lateral ventricle and a definite hydrocephalus. The microscopic examination showed the tumor to be made up of sarcoma-like cells which very possibly by modern methods of staining would have proved to be gliomatous.

*Reported in detail: *Jour. Nerv. & Ment. Dis.* 37:99, 1910.

The significance of this case for our present purpose lies in the early appearance of epileptiform seizures, the character of which led to probable localization on the left side, proved to be correct at operation. It serves to emphasize the fact now generally recognized that any seizures whether of the petit mal, Jacksonian or of more severe type should give rise to the suspicion of tumor.

Case 4—The patient was a woman of 22. Her first symptom was headache to which no particular attention was paid at the time. Later she had some blurring of vision followed by a prickly sensation in the left arm which started in the fingers and spread rapidly up the arm, finally involving the left side of the face, the left half of the tongue and the inner side of the mouth. Coincident with these sensory disturbances, the left hand felt somewhat helpless but was by no means paralyzed. These attacks were of only a few minutes' duration, nausea supervened and she thought that she may have lost consciousness. The whole situation grew worse until finally she had a general convulsive seizure. This was a year or more after the onset of the headache.

While being examined, she had the following attack which, until unconsciousness supervened, she was able to describe in great detail. At the beginning she said that her left hand was beginning to feel "numb and queer" and that she had pain in the region of the biceps and in her side. There was very slight movement of the whole left side which was not at the outset convulsive in character. She felt very anxious and apprehensive as her discomfort increased during a period of perhaps three minutes. At the end of this time twitching of the fingers and of the hand began, still with retained consciousness. This continued for one or two minutes, gradually growing more severe until rather suddenly the convulsion spread over the whole body with loss of consciousness and the usual appearance of a typical epileptiform attack with pronounced cyanosis, from which she recovered entirely in five to ten minutes with a complete restoration of normal consciousness. The eyegrounds showed marked choking and the diagnosis of tumor was unquestioned.

She was immediately referred to the Brigham Hospital and operated on by Dr. Harvey Cushing. A large and extremely vascular tumor, at that time called an endothelioma (now meningioma) was removed from the region of the motor cortex. She made a good operative recovery and worked actively for a number of years but with a continuance, as predicted by Cushing, of her attacks at rather

rare intervals. She was found one morning dead in bed several years later.

In this case although the original Jacksonian-like attack was preceded by headache which should have at once aroused suspicion as to the actual condition, the first pronounced symptom was a sensorimotor disturbance in the left arm which later developed into typical general convulsions always, however, ushered in by obvious irritation in the left arm area. In this connection the case is significant as again demonstrating the importance of focal signs of a Jacksonian type. Earlier operation might well have been even more successful.

Confusion in diagnosis may, at times, be occasioned by such a case as the following:

CASE 5—The patient, a man of 24, since the age of 8 had had what he called "numb spells", the exact nature of which was not determined. The first objective symptom was hemianopsia which came on without warning and lasted about fifteen minutes, associated with a sense of confusion if his eyes were open. He was able to talk during such attacks but at the beginning had difficulty in thinking of the proper word. He had also extreme acuteness of hearing and felt "very nervous". The developed attack as described to me was as follows:—After such a period of nervousness, his little finger, usually the left, began to grow numb. This gradually extended over all the fingers and the thumb in regular sequence, then the same sensation proceeded up the arm and when it had reached nearly to the elbow the numbness began to decrease in the fingers. From the elbow, the numbness extended up the arm and gradually involved the lower face on the same side, then the tongue, the sensation extending thence into the throat, with gagging. He often vomited; the saliva was of peculiar taste but he had no actual nausea. At this point he felt as if he were about to lose consciousness but instead a violent bilateral frontal headache came on lasting for hours with at times definite vasomotor disturbance in his face, swelling and flushing. He was weak and apprehensive for several days following. He never vomited after the headache, nor did he ever lose consciousness. His mother had similar attacks.

This case is obviously one of migraine with onset closely simulating Jacksonian attacks from focal cortical irritation. The association with temporary headache, hemianopsia, transient vomiting, and lack of complete limitation to one side naturally differentiates it from a more serious type of disturbance of which the previous cases are examples. In the differential diagnosis it is always desirable to bear migraine in mind. It is of some interest that a diagnosis of hysteria had been made by an eminent diagnostician in the West.

Although never himself using the term later associated with his name, Hughlings Jackson has been generally regarded as the first to describe in detail the type of attack since known as Jacksonian, in spite of the fact that Bravais in 1824 had drawn attention to one-sided convulsions with retained consciousness*. Through the experimental researches of Hitzig and Fritsch, supplemented by Ferrier in England combined with the painstaking clinical observations of Jackson, the significance of focal convulsive attacks in the determination of cerebral localization was definitely and finally established. Over sixty years have passed since this pioneer work was done without materially altering the facts. It has since been recognized that cortical irritation or possibly the removal of inhibition may lead to a local discharge, which, if not too extreme, results in sensory or motor response without loss of consciousness,—the type of attack to which the term Jacksonian has been applied. That this, however, is a matter of degree rather than of kind is shown by the fact that there are various gradations between focal attacks without loss of consciousness and others beginning in the same way which ultimately become general in character with loss of consciousness. Penfield† in this connection has recently said that—"When one studies the cases of so-called idiopathic epilepsy or generalized epilepsy, a large percentage of them prove to belong to the group of focal epilepsy; and it seems to me that Jackson's original conception should be expanded now to include focal epilepsy."

Of the five cases here reported, the first is an exquisite example of the Jacksonian type of attack, very sharply localized and without loss of consciousness, which from the history, diagnostic difficulties and postmortem findings justifies its publication. The other cases, briefly reported, illustrate (Case 2) a series of Jacksonian-like attacks involving an arm area with accompanying sensory disturbance of doubtful etiology, possibly tumor. Case 3 is an example of apparently "essential" epilepsy, with, however, slight focal indications, due to tumor and bearing out Penfield's suggestion, to which reference has been made. The fourth case is a typical one, again of tumor, with well-developed arm involvement, both sensory and motor, of the Jacksonian type, resolving itself into a general convulsive seizure, indistinguishable from an ordinary so-called idiopathic attack. Finally the fifth case with focal onset is an example of migraine, not easily to be distinguished from a Jacksonian attack before the onset of headache.

Certain features of these cases are worthy of more detailed comment. First and most important is the relation between tumor and focal attacks. Such a suspicion should always be aroused, even in the complete absence of other signs or symptoms suggesting intracranial pressure, as illustrated by the case reported in some detail, and this in spite of the long continuance

*Jackson's contributions to Epilepsy and Epileptiform Convulsions have recently been collected in a single volume—Selected Writings of John Hughlings Jackson. Hodder & Stoughton, London, 1931, edited by James Taylor.

†Discussion of paper by Fincher and Dowman: J. A. M. A. 97:1375, 1931.

of the attacks in essentially unchanged form for upwards of ten years, only growing more frequent toward the end.

In a recent statistical study of 130 cases of Jacksonian attacks, Fincher and Dowman[1] found that 29+% were due to tumor, and that 13 of the 32 tumor patients had at some period of their illness generalized convulsions, which so far as it was possible to learn, probably also occurred at the outset in my case. It is difficult to understand why the seizures should become less general and more circumscribed without loss of consciousness in a gradually growing tumor. That it occurs, whatever the explanation may be, should lead to the assumption that a neoplasm rather than some vague general etiological factor is responsible, in the absence of traumatism or other obvious cause of cerebral injury. Of the 32 cases in Fincher and Dowman's series of tumor, 12 gave no evidence of intracranial pressure and, as in my Case 1, of these, 12 gave no other antemortem evidence of intracranial lesion. Bailey and Cushing[2] have likewise called attention to this fact.

From the diagnostic standpoint, therefore, one must depend in addition to the focal attacks themselves, upon such clinical aids as we now have, notably x-ray and encephalogram. In my case a small area of calcification in the frontal lobe and a distortion of the ventricles as shown by an encephalogram determined the diagnosis of probable tumor which led to the operation, certainly justified in spite of the unfortunate and unexpected outcome.

In the other two cases of unquestioned tumor, both operated upon, one resulted in a probable prolongation of life with, however, the added symptom of persistent aphasia, always a danger in left-sided frontal neoplasms but with relief of pressure symptoms and epileptiform attacks, and the other in practical recovery, so far as her general activities were concerned but with a persistence of convulsive attacks at infrequent intervals, with final death from undetermined cause after a number of years.

Treatment—Surgical exploration followed by such procedures as may be indicated remains the only rational treatment in dealing with focal attacks, which have tumor as their presumable cause. With traumatic, vascular or other lesions, congenital or acquired, which may lead to similar seizures this communication is not concerned. It is noteworthy that neoplasm is the most frequent cause of localized, so-called Jacksonian seizures, and as already implied, should be given first place in a diagnostic estimate in all cases in which the causative factor is not obvious. In Fincher and Dowman's[3] summary 28 craniotomies were done for the removal of tumors, of which 22 were gliomas (variety not specified) and of these 13 were free from attacks at last report. The average time since operation was upwards of three years. In five ultimately fatal cases, one after a lapse of five years, there was likewise no recurrence of attacks. The strikingly successful result of operation in this group of cases is altogether encouraging, if a little surprising. It is regrettable that details of history and operative procedure are not given. In no case, in this series of observations, were preëxistent attacks made worse or more frequent by operation. Although such brilliant operative results may not ordinarily be expected, it is probable, with constantly improving technique, and more complete understanding of cortical function, that the bugbear of danger to life, further damage and consequent increase in attacks through operative efforts may in large measure disappear in spite of an occasional unexplained fatal outcome as in Case 1 here reported.

The injection with alcohol of an epileptic zone, previously determined by electrical stimulation has been advocated, but obviously is not applicable as more than a possibly palliative measure in cases of tumor when removal of the growth is impossible, or for any reason inadvisable. The method of electrocoagulation which more effectually and permanently destroys the zone of irritation offers a method of alluring possibilities, which demands further investigation.

The points to which I wish to call particular attention are—First: The frequency of tumor as a cause of focal convulsive attacks.

Secondly: The difficulty of diagnosis, particularly when the motor cortex is not involved, in the absence of increased intracranial pressure.

Thirdly: The necessity of x-ray and encephalogram in the diagnosis of cases otherwise difficult of determination.

Fourthly: The importance of surgical treatment.

1 Fincher, E. F. and Dowman, C. E.: Epileptiform Seizures of Jacksonian Character. J. A. M. A. 97:1375, 1931. See also, Gotten, N.: The Incidence of Brain Tumors in Epilepsy. J. A. M. A. 96:1118, 1931.

2 Bailey and Cushing: Tumors of the Glioma Group. Lippincott, 1926, pp. 146 and 162.

3 Op. cit.

THE METABOLIC RATE IN "HYPNOTIC SLEEP"*

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IN the course of an experimental study previously reported concerning the metabolic rate in hypnotically induced moods[1], no consistent difference was observed between hypnotic sleep and normal waking basal conditions. The development of the breathing helmet at the Nutrition Laboratory[2] has enabled us, in a coöperative study, to obtain more nearly conclusive evidence on that question, for the helmet permits the determination of metabolic rate in a considerable series of consecutive ten-minute periods without discomfort or disturbance. Our interest in the possibility of affecting the metabolism through hypnosis had been aroused primarily by the published work of Grafe and his collaborators and others of the Heidelberg clinics[3, 4, 5, 6].

Two subjects were selected on the basis of their excellent hypnotizability, both of them nurses at the McLean Hospital: Mr. B., thirty years old, height 174 cm., sitting height 87 cm., and weight (without clothes) varying between 62 and 65 kg.; and Miss M., twenty-two years old (menstrual period May 11-15), height 170 cm., sitting height 88 cm., and weight (without clothes) varying between 58.5 and 60 kg. Both had served as subjects in hypnosis experiments and exhibited the characteristic phenomena of catalepsy and paralysis during hypnotic sleep, paralysis and amnesia in the posthypnotic condition, posthypnotic acts, analgesia on one hand during sleep and on one hand during the posthypnotic condition, negative hallucination during the posthypnotic condition, and somnambulism. The subjects were each tested at one time or another during our series of experiments to see if the method of hypnosis regularly employed sufficed to bring them to a condition where these phenomena could be elicited. The subjects always exhibited the suggested type of behavior. Cataleptic rigidity of the right arm was demonstrated in each experiment. Perhaps the most impressive indications to the skeptical onlooker, of the genuineness of the hypnotic state, were the analgesias, particularly the absence of facial response to vigorous pin-pricks, sometimes administered with considerable force by one of the skeptics. Neither of the subjects was well trained in metabolism experiments. One (the woman) had had her metabolism determined twice.

Each subject, in the post-absorptive condition and lying, was studied on six different days. Usually observations were made during nine 10-minute periods each morning. After three basal periods, the breathing helmet was removed and the subject brought under hypnosis and out again a number of times in order to insure good rapport. A typical hypnosis is thus described in the protocol of May 19, 1930: "Dr. L. presses hand on subject's forehead; says, 'Sleep deeply and quietly. Deeper, deeper, deeper, deeper, deeper. I am going to wake you up. When I count to three you will wake up. When I raise my finger you go to sleep. You will be completely relaxed and will have a feeling of profound well-being, as if lying on the beach, on a warm day, undisturbed, listening to the waves. You will be completely relaxed.' Dr. L. repeats these 'sleep' and 'wake' signals six times in fairly rapid succession, the raised finger meaning 'sleep', and 'one, two, three' meaning 'wake'. The sixth time that the subject is awake, the helmet is adjusted, completeness of closure is checked, and then the sleep signal is again given. (The rubber diaphragm of the helmet easily transmits voices and the window transmits visual signals.) Instrumental observations of respiratory exchange and heart beat through three 10-minute periods are punctuated, at each of the two pauses, by Dr. L.'s instruction: 'Your feeling of well-being is perfect and your relaxation complete.' Subject then awakens on 'one, two, three' signal, the helmet is removed, and the suggestion is given, under hypnosis again, that she will be her 'normal self again in every respect'. The metabolism is then measured again during three periods under normal basal conditions."

The metabolic rates were determined by means of the helmet apparatus. Orientation measurements on May 14 and the observations on May 16 were made at the Nutrition Laboratory. The apparatus was then transported to the McLean Hospital and during the rest of the experiments was there operated by one of us (E. L. F.) thoroughly familiar with it. Continuous records of the heart beat were obtained by means of an electrocardiograph whose camera was slowed to run at about 6 cm. a minute. This arrangement did not always function in the earlier experiments, and the heart rates estimated from portions only of a record are distinguished in Table I by the absence of decimals. Rates calculated from a complete count of every heart beat during the period are expressed to tenths of a beat.

The data obtained in the different periods in the several experiments with our two subjects are recorded in Tables I and II. The average results derived from these period values are summarized in Tables III and IV. All values in Tables I and II enclosed in parentheses have

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been omitted in making the averages. The results obtained during hypnosis have been italicized. The transition period with Miss M. on May 16 was secured during the process of bringing the subject into the hypnotic state. The three periods with Mr. B. on June 6 described as "special" represent an attempt to secure observations during normal sleep, since the subject was drowsy at the time. This effort failed, however, because the subject snored and the consistency of a somewhat trained subject. Restricting our consideration to the data obtained during the last four days, we note that with the woman the algebraic average of the differences between the oxygen consumption during the control and hypnosis periods is so small as to be obviously of no importance. But the consistency of the small differences with the man appears significant. This significance, if any, is canceled, however, by the control experiment with Mr. B.

TABLE I

OXYGEN CONSUMPTION AND HEART RATE UNDER BASAL CONDITIONS AND HYPNOSIS — MISS M.

Date and condition	O_2 consumed per minute	Heart rate per minute	Date and condition	O_2 consumed per minute	Heart rate per minute
1930	c.c.		1930	c.c.	
May 16			May 23		
Control	235	73	Control	207	77
"	225		"	201	76
"	234		"	203	77
Transition[1]	[2](247)		Hypnosis	*206*	*70*
Hypnosis	*222*		"	*199*	*71*
"	*221*		"	*202*	*71*
"	*228*		Control	194	75
Control	201		"	194	75
			"	196	78
May 19			May 26		
Control	231	73	Control	228	80.5
"	230	72	"	219	79.2
"	232	72	"	222	77.1
Hypnosis	*216*	*70*	Hypnosis	*214*	*78.1*
"	*213*	*74*	"	*226*	*76.7*
"	*210*	*74*	"	*218*	*79.4*
Control	224		Control	219	79.7
"	222		"	216	79.5
"	215	77	"	209	81.2
May 21			May 28		
Control	208	75	Control	215	79.6
"	204	78	"	214	77.5
"	204	79	"	213	78.9
Hypnosis	*208*	*66*	Hypnosis	*leak*	*73.3*
"	*208*	*68*	"	*leak*	*69.8*
"	*207*	*72*	"	*212*	*69.7*
Control	216	72	"	*206*	*74.8*
"	211	72	Control	225	74.5
"	205	73	"	215	70.2
			"	210	77.6

[1]Obtained while bringing subject into hypnotic state.
[2]Value in parentheses not included in averages given in Tables III and IV.

sound of his snoring, reverberating within the metal helmet, awakened him each time he fell asleep. Fortunately he did not snore in "hypnotic sleep". On June 13 a period during posthypnotic anxiety was carried out with Mr. B. This anxiety experiment was inserted in our series to check some previous observations on posthypnotic anxiety. The heart was a bit "jumpy", showing three "sudden accelerations" (see explanation on page 780) during the subsequent period of simple hypnosis.

In studying the metabolic rates summarized in Table III we have considered it proper to separate those of the first two days, which may be considered as training periods, from those of the last four which should, and do, show the greater on June 4. On that day the subject was not hypnotized, and yet the oxygen consumption during the three middle periods averaged about 3 c.c. less than that during the other periods on the same day. From our observations we therefore conclude that the metabolic rate was not reduced by hypnosis, in either subject, below the normal basal level.

From the oxygen data obtained on the two training days it does appear, however, that hypnosis may help in bringing an untrained subject into the so-called "basal condition" more rapidly than does simple training. This may depend merely upon the greater efficacy of hypnosis, as compared with ordinary reassurance, in overcoming the subject's anxiety. If we had not

avoided this source of error, by training our subjects, we might have been led to agree with the observations published by Goldwyn[7], who reported, after a study of eighteen (untrained) subjects, that "the basal metabolism was decreased (3.88 per cent) under hypnotic suggestions tending to produce mental and physical inactivity". Since there is a reduction of approximately 10 per cent in the metabolic rate during normal sleep, our failure to observe a corresponding drop during hypnotic sleep may be taken as experimental evidence that the two conditions are physiologically dissimilar. This experimental result supports the general impression obtained from personal experience by one of us (H. L.) that "sleep" is a misnomer for the hypnotic condition.

The evidence of a slowing in heart rate under hypnosis, which appears with fair consistency in Table IV, is strengthened rather than weakened by detailed examination of our records. To facilitate comparison with Table III, the data for the two practice days in Table IV have been separated from those for the other days, as was done in Table III. The control experiment of June 4, without hypnosis, showed no decrease in heart rate during the three middle periods. This finding increases the probability that the slowing of the heart rate during the three middle periods on the other days was really due to hypnosis. Our records were searched for any other circumstance that might explain this slower rate, such as a possible excitement immediately after the subject awoke from hypnosis or anxiety toward the end or at the beginning of control periods. The latter seems to have had some influence on Miss M, but not enough to account for the whole effect. No hypnotic suggestion was given to our subjects to have the heart rate lowered. Such a command was given to the fasting subject studied by Hoover and Sollmann[8], and they found that during prolonged hypnotic "sleep" his pulse rate fell from seventy to the forties and occasionally below forty.

Mr. B.'s heart records are of particular interest because he shows a rather extreme brady-

TABLE II

OXYGEN CONSUMPTION AND HEART RATE UNDER BASAL CONDITIONS AND HYPNOSIS — MR. B.

Date and condition	O_2 consumed per minute	Heart rate per minute	Date and condition	O_2 consumed per minute	Heart rate per minute
1930	c.c.		1930	c.c.	
June 2			June 9		
Control	238	44.3	Control	225	44.6
"	220	44.8	"	212	45.6
Hypnosis	*222*	*44.1*	"	212	43.2
"	*215*	*43.1*	Hypnosis	*215*	*41.0*
Control	230	40.8	"	*215*	*41.3*
"	219	42.7	"	*207*	*41.0*
			Control	210	44.4
			"	216	42.3
			"	211	43.5
June 4			June 11		
Control	216	46.6	Control	211	43.6
"	223	46.8	"	225	44.2
"	216	46.7	"	208	43.2
"	217	47.3	Hypnosis	*211*	*43.6*
"	217	46.6	"	*210*	*42.1*
"	214	46.1	"	*210*	*42.7*
"	213	46.4	Control	214	44.9
"	216	46.1	"	208	45.5
"	230	45.0	"	211	45.3
June 6			June 13		
Control	219	47.1	Control	217	43.3
[1]Special	[2](215)	(45.5)	"	215	42.3
"	(216)	(45.1)	"	217	44.3
"	(206)	(45.9)	Hypnosis	*219*	*41.5*
Hypnosis	*220*	*46.9*	"	*211*	*41.2*
"	*217*	*45.4*	Posthypnotic anxiety	*(240)*	*(60.0)*
"	*218*	*47.2*	Hypnosis	*(219)*	*(44.6)*
Control	219	48.6	Control	219	43.4
"	226	52.6	"	223	43.8
			"	225	44.0

[1]Subject drowsy. Tried to secure observations during normal sleep, but subject awakened by sound of his snoring each time he fell asleep.

[2]Values in parentheses not included in averages given in Tables III and IV.

cardia, with moderate sinus arrhythmia. He has, however, no signs or symptoms of organic heart disease, nor does he show any abnormal limitation in cardiac functional capacity. Besides the slight average slowing, hypnosis had a steadying influence on his heart rate. A striking example of this steadying effect was brought out by counting the instances of "sudden acceleration" of rate, when three heart beats would occur in the same length of time as the preceding two beats. Such a "sudden acceleration" occurred seventy-seven times (not including five which came in two periods affected by hypnotically induced anxiety). Of these seventy-seven, only one was in an hypnotic period, which gives a ratio of 27 to 1, when calculated on the basis of equal time intervals. No phenomenal difference comparable to this could be noted on examining Miss M.'s records. Her slowing of heart rate under hypnosis was due, more commonly, to the occurrence of what were, for her, unusually slow beats, rather than to the elimination of quick beats.

In view of the rough general correlation commonly recognized between pulse rate and metabolic rate, it seemed odd to observe in our experiments a systematic difference in heart rate where no systematic difference in the metabolic rate could be demonstrated. The absence of correlation is sufficiently obvious from a simple comparison of Tables III and IV, but we have also confirmed it by the calculation of Pearson's coefficient for each subject from the data in Tables I and II. It may be inferred, therefore, that the physiological mechanism, through which hypnosis in our experiments lowered the heart rate, is one that does not simultaneously reduce the metabolic rate to an appreciable degree.

TABLE III

COMPARISON OF AVERAGE OXYGEN CONSUMPTION (C.C.) PER MINUTE DURING PERIODS OF HYPNOSIS AND CONTROL

Miss M.	May 16	May 19	May 21	May 23	May 26	May 28	Algebraic average of differences in last four days
Hypnosis	224	213	208	202	219	209	
Control	224	226	208	199	219	215	
Difference	±0	—13	±0	+3	±0	—6	—0.8
Mr. B.	June 2	June 4	June 6	June 9	June 11	June 13	
Hypnosis	219	—	218	212	210	215	
Control	227	[1] 216 [2] 219	221	214	213	219	
Difference	—8	—3	—3	—2	—3	—4	—3

[1]Average of periods 4, 5, and 6 in Table II.
[2]Average of periods 1 to 3 and 7 to 9 in Table II.

TABLE IV

COMPARISON OF AVERAGE HEART RATES PER MINUTE DURING PERIODS OF HYPNOSIS AND CONTROL

Miss M.	May 19	May 21	May 23	May 26	May 28	Algebraic average of differences in last four days
Hypnosis	72.7	68.7	70.7	78.1	71.9	
Control	73.5	74.8	76.3	79.5	76.4	
Difference	—0.8	—6.1	—5.6	—1.4	—4.5	—4.4
Mr. B.	June 2	June 4	June 6	June 9	June 11	June 13	
Hypnosis	43.6	—	46.5	41.1	42.8	41.4	
Control	43.1	[1] 46.7 [2] 46.3	49.4	43.9	44.4	43.5	
Difference	+0.5	+0.4	—2.9	—2.8	—1.6	—2.1	—2.3

[1]Average of periods 4, 5, and 6 in Table II.
[2]Average of periods 1 to 3 and 7 to 9 in Table II.

SUMMARY

Simple hypnotic sleep, with suggestions for relaxation and euphoria, may have an influence

on metabolic rate determinations by eliminating or reducing the occasional high figures observed during the early training of subjects, but it does not reduce the rate below normal basal and apparently differs, in this respect, from normal sleep.

The heart rate was slightly reduced by hypnosis.

Although the nature of our experiments did not permit us to test the depth of hypnosis attained during actual metabolism determinations, except to show that it was at least "first stage", control hypnotic experiments indicated that our subjects passed readily into the third stage, and it seems probable, therefore, that some of our observations, if not all, must have covered periods of very deep hypnosis.

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PHYSICIANS' FEES AND HOSPITAL BILLS*

BY MICHAEL M. DAVIS, PH.D.†

THE total outlay for the care and prevention of disease amounts to about three and a quarter billion dollars annually in the United States, according to tentative estimates based on studies by the Committee on the Costs of Medical Care. This figure seems large, yet it is less than 4 per cent of the people's annual current income. The complaints from both the public and the professions about the economic aspects of medical service are due much less to the size of the total of all sickness bills than to certain characteristics of these expenditures. Sickness expenditures differ in important respects from other items in family budgets. A study of the items which make up the three and a quarter billion dollars displays that at once.

1. The expenditure for organized preventive measures is deplorably low—less than 100 millions, or only one dollar for prevention to nearly thirty-five spent for cure. The total of suffering and of expenditure due to disease could be substantially reduced if more adequate sums were put into preventive work.

2. Drugs, medicines, and appliances constitute between 20 and 25% of the total, and about half a billion dollars of this goes for worthless or harmful materials.

3. The amount expended for physicians comes to less than 30% of the total. Physicians' and dentists' bills together come to 40% of the total. This is the largest single item, yet constitutes less than half the annual outlay of the American people for the care of sickness.

4. The outlay for the support of hospitals is large, nearly equaling that for physicians. About 350 million dollars of this outlay comes from taxes, about 30 millions as income from endowments or in current charitable gifts from individuals, and about 350 million from individuals as payment for hospital service rendered. If the fees received by physicians and surgeons for their care of hospitalized patients were added to the hospital charges themselves, we should find hospitalized illness to be the largest single item in the total sickness bill.

5. Sickness bills differ from other items in family budgets because the expense of sickness is uncertain and unpredictable. No family can tell in advance how much sickness it should plan or budget for next year. An extensive study by the Committee on the Costs of Medical Care shows that the expenditures for drugs and medicines are fairly evenly distributed among families, whereas the expenditures for professional services (doctors, dentists, nurses) and for hospital care fall very unevenly. More than half these expenditures fall upon less than 15% of the families.

6. Taking hospital care alone, the unevenness is still greater. The total charges to paying hospital patients for institutional services, professional fees, and special nursing amount to about 750 million dollars yearly in the United States and this great sum, nearly one-quarter of the total sickness bill, falls in any given year on about four per cent of the population. No family of moderate means can tell in advance whether or not one of its members will fall, next year, within that unlucky four per cent. These face a bill which on the average runs about $150 for each hospitalized illness and which may run to several times that figure. If a family could only know in advance that this emergency would befall them, they might be able to budget against the expenditure. But sickness is not predictable.

We are all more or less familiar with the remarkable growth of hospitals during the past 25 years, in numbers, in quantity of beds, and in scope of service.

*Read at the Combined Meeting of the Boston Medical Library and the Suffolk District Medical Society, Boston, January 27, 1932.

†Davis—Director for Medical Services, Julius Rosenwald Fund. For record and address of author see "This Week's Issue," page 812.

The whole population and no longer the very poor are now interested in hospital service and in its costs. Whether hospital charges are too high in relation to the cost of good service is a matter of some dispute. But there can be no dispute that the cost is too high in relation to the financial ability of a large proportion of those persons, who in any given year, are called upon to meet it. It is important to bear in mind that in considering hospital costs in relation to people's ability to pay, there is no use in taking into account the hospital charges alone. It is the total cost of a hospitalized illness that must be taken into account, and this total includes professional fees as well as charges for room, board, operating room and other special services. Professional fees to physicians, surgeons, and special nurses amount on the average to somewhat more than half the total cost of a hospitalized illness. It is this total cost with which the patient's exchequer must reckon.

The average total cost of a hospitalized illness to a private patient is probably about $150, or a little more, but an average figure is quite misleading, since a considerable number of hospital illnesses run to much larger amounts, while some—as the average tonsillectomy—are lower. Persons of moderate means, i.e., with family incomes of from $2,500 to $3,000, cannot without difficulty or distress meet bills for a single illness which run to ten per cent or more of their annual income and which usually befall unexpectedly as illness from its nature is likely to do.

It is well to have in mind that the height and burden of the costs of hospital care have been recognized in all countries in which hospitals are well developed. In every country in the world, only a small fraction of the population pays the total expense of hospitalized illness directly. In most countries of Europe, the great bulk of hospitals are government institutions. Their expenses of maintenance are partly spread over the whole public through taxation, and in most countries, the remainder of the expense for many of the people, is paid from the insurance funds to which these people and their employers are required by law to contribute. In Denmark practically all hospitals in one of the best hospital systems in the world are supported almost entirely out of taxes. In Great Britain, the major part of hospital care is also supported by government, though some patients now pay directly for a part of the cost of their care in government hospitals. The famous "voluntary hospitals" of London and other large cities are maintained chiefly by endowments and gifts; only slightly by payments from patients.

In the United States nearly all of our hospitals for mental disease and for tuberculosis and about a third of our general hospital beds are also supported by taxation. It should be pointed out that taxation is from this point of view a means of distributing the expense of hospital care so that it falls upon the community as a whole, not upon the individual when he is sick. Insurance is another method of distribution of the expense—a method in which the individual retains much more direct responsibility.

In our general hospitals which are not run by government, a part of the costs of hospital care is also distributed in most cases, by reason that the fixed capital (land, buildings, and permanent equipment) is given and replaced by gifts and the fixed charges of interest and depreciation fall upon donors and not upon patients—not even "full pay" private patients. This and the use of endowments are again devices for reducing the burden of hospital care upon the sick individual and of distributing a part of it over others in the community. The free services of physicians to ward cases have the same effect.

We do not need to concern ourselves with the minute fraction of our population that has large incomes. We do need to have much concern for the seventy per cent or more of our people who are wage-earners, small farmers, or their dependents, and for the so-called middle classes. To a large extent, wage-earners must have the expenses of hospitalized illness paid for by taxation or private charity, or in part by insurance to which they may contribute. The "middle classes" or so-called persons of moderate means do not intend to receive charity either from government or individuals and constitute the great bulk of all the patients who pay the hospitals and the physicians and surgeons for their services. Whatever can be done to relieve the weighty and uneven burden which now falls upon these people, whatever conserves or increases their paying power, will be of great benefit to them, to the hospitals, and to the medical profession.

To stabilize and increase the physician's income from his paying hospital patients requires expedients which will help these people to budget against the expense of hospitalized illness. Sickness cannot be predicted, but sickness costs can be so organized that they can be planned for.

This can be done in two ways:

1. *The Middle Rate Plan.* Enable the patient or his family to learn the total cost of his hospital illness as nearly as possible at the time of his admission to the hospital. This requires that the medical staff of the hospital must agree with the hospital administration on some plan whereby professional fees and hospital charges will be handled together by the admitting office, according to agreed schedules. The middle-class patient cannot be helped so long as he must deal separately with the professional fees and hospital charges. He must be able to plan how to

deal with one bill, not with two or more competing bills.

2. *Hospital Insurance.* The second plan implies the first, but goes beyond it by applying the principle of insurance as a means of conserving and increasing the patient's paying power. A group of persons who paid regularly into a common fund, in amounts properly calculated, would always have ready, in the common pool, the assurance that the expense of hospital illness would be met and that their hospitals and their doctors would be paid.

I have not time or occasion this evening to discuss the details of plans for insurance against hospital illness which might apply to wage earners and also, with certain changes, to the middle classes. But I do wish to present certain experiences and figures which seem to me to demonstrate the advantages of the Middle-Rate Plan.

A study has been made of approximately 500 unselected cases in each of two hospitals, taking patients of moderate means. Both of these hospitals are in communities of somewhat over 1,000,000 population. The average "charge" per case was practically $160 for each hospital, the doctors' fees being 37 per cent of the total in Hospital A and 46% of the total in Hospital B. In Hospital A, the doctors' fees were limited and were coördinated with the hospital charges. In Hospital B, the doctors maintained individual financial relationships with their patients. Both Hospital A and Hospital B are institutions of national reputation for good medical service and for excellent administrations; both have a similar type of professional staff organization.

The proportions of physicians' and nurses' fees to total charges are, of course, influenced not only by the financial relationships with patients but also by the nature of the diseases found, operations performed, etc. The purpose of Table I is merely to show that doctors' fees are a substantial proportion of the costs of hospitalized illness to the patient.

The effect of the Middle-Rate Plan upon actual costs to patients and returns to physicians is revealed in another study. This is a comparison in four hospitals of cases requiring appendectomies.

A study was made of a series of appendectomy cases in the two institutions previously mentioned and in two additional ones represented in Table II as Hospitals C and D. Both C and D are in a city of about 500,000 and are well-run average institutions with semi-open staffs, having the usual methods of admission and rate-fixing. The number of cases and the years to which they apply are indicated on the table.

For each institution the physicians' and surgeons' fees comprise approximately one-half of the total costs to patients. There is a wide variation, however, in the proportions of the total charges which are made for hospital services and special nursing. There was but one case in 20

TABLE I

TOTAL COSTS OF HOSPITALIZED ILLNESS FOR UNSELECTED CASES TREATED IN TWO METROPOLITAN HOSPITALS FOR PATIENTS OF MODERATE MEANS, ACCORDING TO AMOUNTS CHARGED BY HOSPITALS, SPECIAL NURSES, AND PHYSICIANS AND SURGEONS

Type of Charges	Hospital A 503 Cases—1930 Amount	Hospital A Per Cent of Total	Hospital B 483 Cases—1929 Amount	Hospital B Per Cent of Total
Hospital	$44,954.11	56.0	$40,558.70	53.0
Special Nurses	5,890.00	7.3	1,014.00	1.3
Physicians and Surgeons	29,513.00	36.7	34,900.00	45.7
Total for All Cases	$80,357.11	100.00	$76,472.70	100.00
Average for Case	$159.76		$158.33	

TABLE II

TOTAL CHARGES FOR THE CARE OF "PAYING PATIENTS" TREATED FOR APPENDICITIS IN FOUR METROPOLITAN, NON-GOVERNMENT HOSPITALS, ACCORDING TO AMOUNTS SPENT FOR HOSPITAL SERVICE, SPECIAL NURSING, AND MEDICAL AND SURGICAL ATTENTION

Type of Charges	Hospital A 20 Cases—1930 Total Amount	Hospital A Per Cent of Total	Hospital B 22 Cases—1929 Total Amount	Hospital B Per Cent of Total	Hospital C 43 Cases—1930 Total Amount	Hospital C Per Cent of Total	Hospital D 47 Cases—1930 Total Amount	Hospital D Per Cent of Total
Hospital	$2,051	52.2	$1,932	44.1	$3,519	32.2	$3,680	32.8
Special Nurses	54	1.4	396	9.0	1,726	15.8	1,633	14.6
Physicians and Surgeons	1,823	46.4	2,050	46.9	5,674	52.0	5,894	52.6
Total	$3,928	100	$4,378	100	$10,919	100	$11,207	100
Average Total Charge	$196		$199		$266		$238	

requiring special nursing in Hospital A. This service involved a fee of $54, or 1.4 per cent of the total costs to all patients. Four cases out of 22 were attended by special nurses in Hospital B and involved an average fee of $99, or nine per cent of the total fees. Hospitals C and D, however, reported that 25 cases in each institution, or more than half of the patients, were served by special nurses, whose fees represented in each institution about 15 per cent of the total charges against all patients. The amount which is charged for special nursing apparently tends to reduce the hospital's share in total fees, rather than to restrict the proportion a physician will charge. In none of the hospitals were any nursing, and doctors' bills in full in 1930, a year of depression. The 22 cases treated in Hospital B likewise paid a large proportion of their total fees, but the doctors and the hospital collected but 92 and 91 per cent of the total charges. The doctor's average collection from these cases discharged in July 1929, a period of prosperity, was $85, slightly less than from cases treated in 1930 in Hospital A, using the Middle-Rate Plan. The lower average resulted from failure to collect more than nominal fees from four of the 22 patients.

The experiences as to doctors' collections in the cases treated in Hospitals A and B are quite similar, even though Hospital B is not

TABLE III

AVERAGE CHARGES COMPARED WITH PERCENTAGES ACTUALLY COLLECTED FROM PAYING PATIENTS TREATED FOR APPENDICITIS IN FOUR METROPOLITAN HOSPITALS

Type of Charges	Hospital A 20 Cases—1930		Hospital B 22 Cases—1929		Hospital C 43 Cases—1930		Hospital D 47 Cases—1930	
	Amounts	% Collected	Amounts	% Collected	Amounts	% Collected	Amounts	% Collected
Hospital	$102.25	100	$87.80	92	$85.86	97.3	$78.31	91.6
Special Nurses*	2.70	100	18.00	100	42.10	92.7	34.74	98.6
Physicians and Surgeons	91.15	100	93.18	91	138.39	50.2	125.40	46.3
Total	$196.10	100	$198.98	94.7	$266.35	72.3	$238.45	68.8

*The average fee for special nursing as shown here is determined by dividing the totals paid to special nurses by the full number of cases treated in the respective hospitals.

"charity" cases included in the tabulations. The hospital administrators' opinions, as well as detailed information secured by questionnaire, revealed that the patients were persons of moderate means accustomed to a comfortable standard of living, but to few luxuries. All patients were treated in private or semi-private accommodations. The daily room rates for hospital service were somewhat higher in Hospitals A and B than in the two other institutions. The total costs to patients for hospital and nursing service were, however, lower in the two institutions with the higher room rates, in view of the fact that fewer patients found it necessary to engage special nurses.

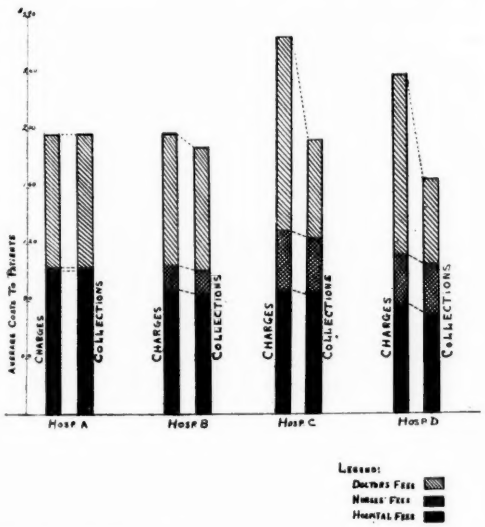
The average total fees per case, as shown in Table III, indicate that the lowest were for the cases treated in Hospital A, conducted on the Middle-Rate Plan, even though the hospital fees were highest for these patients. The fees charged for doctor's services, on the other hand, were the lowest in Hospital A, averaging $91 per case. In Hospital B, the average charge was $93, whereas the average professional charge per case in Hospitals C and D was $139 and $125 respectively.

The actual amounts collected by physicians, however, are not the same as their charges. A further examination of Table III reveals some interesting contrasts with regard to this point. The 20 cases in Hospital A paid their hospital, formally using the Middle-Rate Plan. The physicians attending these patients, all of whom occupied two-bed rooms, tended to use a standard fee for cases requiring appendectomies. There was, of course, an advantage in the comparison in favor of Hospital B, because of the year during which the cases were treated. But even in 1930, the doctors collected, through the hospital, 100% of their actual charges to Middle-Rate Plan Cases.

The facts with regard to collections in Hospitals C and D are in still more sharp contrast to those of the cases treated in Hospital A. In both Hospital C and Hospital D, the hospital and special nursing fees were collected to more than 90 per cent of the total charges. But the physicians' and surgeons' fees fared quite differently. Three months after date of discharge, approximately half of the total fees had been neither paid nor arranged for. In one institution, out of 43 patients and in the other, out of 47, there were 12 and 13 patients respectively who had paid nothing to the physicians and surgeons who had attended them. Although the doctors had supposedly attempted to scale their fees in accord with the patient's abilities to pay, the average amounts actually paid were less than the fees collected in Hospital A with charges arranged through the hospital admitting officer. In Hospital A only four cases were charged more than $100 for doctors' services,

whereas in Hospitals C and D, even the average fees exceeded this amount by a wide margin. The collections by doctors treating cases in Hospitals C and D, were, however, but $69 and $58 respectively.

The doctor, apparently, is the residual creditor under the traditional hospital system for private patients. For, although the doctors' charges exceeded 50 per cent of the amounts



FEES CHARGED COMPARED WITH FEES COLLECTED IN FOUR METROPOLITAN HOSPITALS.
Appendicitis Cases in Four Metropolitan Hospitals.

charged against the appendectomy cases in Hospitals C and D, the fees received by physicians and surgeons were scarcely 35 per cent of the actual money paid by these patients. In major surgery, particularly, there is need for coördinating the total costs which a patient will incur, if the doctors are to receive a reasonable proportion of the fees collected.

From these figures one cannot but conclude that doctors, hospitals and patients all gained by the Middle-Rate Plan as administered by Hospital A. Doctors and hospital administrators will probably agree that many patients, if not controlled, tend to engage hospital accommodations which are beyond their means or which are needlessly expensive. They also tend to engage special nurses unnecessarily. The doctor's fee must always compete with hospital charges for a share of the patient's payment. The general tendency to engage unnecessarily expensive hospital and nursing service limits the amount a doctor can *charge* for his services. The drain upon the patient's resources in payment for hospital and nursing services limits the amount a doctor can *collect* for his services.

A doctor will in some cases collect more from patients of moderate means when making individual arrangements. In other cases, he will collect nothing or much less than his charges. The net result seems to be that on the average he is likely to collect less.

The hospital under the Middle-Rate Plan is in a position to establish (and collect) a higher doctor's fee than is the doctor, particularly from other than well-to-do patients; for the hospital can better determine ability-to-pay and can enforce the selection of hospital and nursing service within the patient's abilities to pay.

The Middle-Rate Plan is an administrative device which may have additional advantages. It may enable some patients to shift up from "ward" service to the middle-rate service in which the physician is paid, and the element of charity is absent or minimal. It may enable a hospital to reduce its average cost per day of care, if, as is likely, it can keep a larger percentage of its total beds occupied because of the attractiveness of the Middle-Rate Plan. Installment payments and group nursing can readily be made part of the Plan when necessary or desirable.

Problems of competition may arise between hospitals having a Middle-Rate Plan and other institutions in the same community which lack it. The physicians and surgeons who do not belong to hospitals using the Plan may object to public knowledge of the professional rate schedule at the hospitals which do have it, fearing that a general lowering of professional fees may result even for patients of ample incomes. The answer to this objection is to establish a Middle-Rate Plan, with an adequate admission system for judging ability-to-pay, in all well-organized hospitals which receive private patients.

Obviously the Middle-Rate Plan requires mutual confidence and active coöperation between the professional staff and the administration of the hospital. It is equally obvious that it requires efficient hospital management. But these two characteristics should be possessed by all hospitals.

The Middle-Rate Plan may help the patient to plan to meet his bill, and the doctor and the hospital to collect their shares. But it does not place in the patient's hands, money wherewith to meet it. The application of the insurance principle to the costs of hospitalized illness would be more deep-reaching in its advantages to the patient's budget, and more wide-reaching in the economic groups which might be benefited. Wage earners as well as persons of moderate means might find it within their incomes to insure against hospitalized illness and thus ensure definite payment to the physicians and the hospitals. Such insurance must be developed by organized groups. It cannot be successfully sold by hospitals or by commercial companies to individuals for their selling and maintenance costs will be much higher and what is even more important, there will be adverse

selection of risks. The more sickly will tend to insure. These difficulties can be avoided if insurance is developed among such groups as the employees of a business establishment, the teachers of a school system, the faculty of a college, or a group of "civil servants" in a government department. Experimentation in such hospital insurance is desirable. It will be advantageous alike for doctor, hospital and public to participate in such experiments.

In making hospital care more widely available as a paid-for service rather than as a charitable activity, as well as in broader fields of medical economics, a primary factor is the attitude of the medical profession toward experimentation. Do we not all anticipate that real progress will be by experiment and not by panacea? Within the medical profession the attitude and tradition of experimentation is highly developed in respect to the medical sciences. But unfortunately this has not been so true in the application of medical knowledge to medical services, however, where economic conditions and social institutions must also be reckoned with. The problems of medical economics involve both the public and the profession. In their solution the medical profession cannot dominate and the public should not. What is needed is participation of profession and public in considered experiments, toward the solution of common problems. The attitude of the organized profession has been too frequently one of opposition to change—the antithesis of the scientific attitude required in professional care. It has been shown again and again, notably in this State, that whenever public opinion is aroused and formulated on medical and health matters, an attitude of mere opposition from professional groups is futile and destructive. Historically the great advances in medical education, in hospital service, in the practical application of preventive medicine, have come about through the coöperation of laymen and physicians. The public needs and the public will welcome organized medical leadership.

Discussion

Dr. Walter P. Bowers: My part is to pay a very modest tribute to the speaker of the evening. Those of you who are at all familiar with affairs relating to medical progress and public health administration, in the early part of this century, remember that a gentleman interested in health administration came here from New York because of the expressed wish of an eminent physician of Boston who was very much interested in sociology. During his visit it became known that he was available for the position of Director of the Boston Dispensary and he was immediately drafted into that service. He stayed with us for ten years making a name for himself and administering affairs creditably. He was then asked to return to New York where he took up a teaching position in Columbia and there added to his reputation. After that he became known as a consultant in hospital administration, hospital construction and hospital service. After acting as adviser for these various activities the speaker of the evening was finally employed by the Julius Rosenwald Fund and is now administering the medical service of that Fund.

You thus see that Dr. Davis is qualified to deal with problems which have been discussed tonight because of his contacts with them. So that when there arose in the medical profession, as well as in the public mind, a very strong feeling that in the economic conditions affecting medical practice uncertain and unsatisfactory features were apparent, he, in association with others, was asked to study various questions relating to the sociology and economics in providing service to the people. The study went on for two years without apparent results except an aroused interest among the promoters. Beginning in 1925, through 1926 and up to 1927 Dr. Davis with his friends was studying this particular problem and then in the spring of 1926, at the time of the Meeting of the American Medical Association in Washington, D. C., the beginnings of the Committee on the Costs of Medical Care took shape and from that time to this Dr. Davis has been one of the influential members of this Committee. Having the confidence of the medical profession he has been able to interest the physicians and the public. He had another important function; that was to raise money for the Committee and in that he has shown the same ability exhibited in other fields. So that when the history of the organization shall have been written, Dr. Davis's name will stand as one of the most important factors in carrying on the study on the Costs of Medical Care.

There were a few illustrations of actual conditions which seemed to have started the ball rolling. In a certain county of a southern state, in which there were 18,000 people with only two doctors and no hospitals, the attention of the people who were interested in this matter was concentrated on the possibility of providing medical service in places where it was inadequate. A study of that situation showed that about 16 per cent of these people were sick; 22 per cent of them ambulatory and none of this number had any medical service. That, of course, was a very striking illustration of the needs of certain communities.

A case nearer home is worthy of mention in which a personal problem was found here in Boston. A gentleman, educated, important in his particular field, with an income sufficient to enable him to live comfortably, found his medical

problem acute. He had a family of children and sickness came to that family so that there were three operations in the course of one year. The man had been able to save a few thousand dollars. It took every cent that he had accumulated to meet the emergency illnesses in that one year and when it became essential for him to be sent away for recuperation it was necessary that the organization for which he worked provide him with funds. We could go on and multiply these instances, so you can see why there has been in the minds of some people the definite feeling that the costs of medical care is a subject demanding intelligent study.

When the program of this Committee first became public, there were different reactions. Those on the part of the medical profession were very disturbing, because it was reported at the center of organized medicine in Chicago and throughout the country to be adverse to the supposed purpose of the Committee. There was a very definite preconceived idea that it was to prevent doctors from charging the accustomed fees. This sentiment seemed to indicate a definite distrust of the work of the Committee but very early in its deliberations the Committee made it clear that it did not propose to consider the propriety of fees that physicians were charging. Its purpose was and is to make an economic study in order to place before the people an adequate understanding of the problem in its broadest aspects.

Dr. Davis has spoken of the necessity of coöperation of the medical profession and the public and that, we believe, is of fundamental importance. It ought to be easy to find the answer to the major questions if physicians and the public will join in seeking the solution of the complicated economic problems before the nation. The Committee on the Costs of Medical Care is persistently studying existing conditions. It has not arrived at conclusions; the time is too early for that. In the future the final conclusion will be the result of intelligent coöperation.

Dr. George H. Bigelow: I am very much impressed with a remark that Dr. Wilbur, the Chairman of the Committee, has repeated and which has been touched on by Dr. Davis:—that the conclusions can come only through group thinking. I believe the expression "group thinking" is a very wholesome expression in considering the solution of this problem or in other social, economic problems that we are faced with today.

I am interested in the various studies that are being made, the various experiments in industry, in medical groups, in hospital organization extending the service over what is conveniently thought of as hospital service, and one of the things that impresses me in the difficulty is that whatever conclusion may come there is likely to be a rather sharper limitation of what is the field of public health. That suits me personally. I was asked by a physician where public health ended and private health began. Frankly, I don't know. I am disturbed and I think that many other health officers are disturbed in the tendency toward extending the field, and particularly the tendency to put on health authorities more or less the care of sick individuals because the sick individual is more insistent in his demands than the well individual. There is danger in the burdening of the responsibility of health departments so that its primary function of keeping the well well may be lost in the shuffle.

Dr. Channing Frothingham: In the discussion this evening I was asked to emphasize the relation of an excellent medical education to medical economics. The problem is somewhat different from other business problems because if one is ill one wants the best medical care, while if one is going to buy an automobile, for example, one will usually buy an automobile which one can afford and not necessarily the best. It is the duty, therefore, of medical schools to turn out physicians of the best type and not different grades of physicians. The method of turning out an excellent physician from our medical schools with a minimum of capital investment constitutes a problem to which the medical educators of the country are giving considerable thought. Despite their efforts as time goes on the amount of capital investment in a medical education seems to be steadily increasing and at the present time it is considerable. To become a physician a man must have at least two years of college work and preferably an academic degree. He must then spend four years in a medical school and one or two years as a house-officer in a hospital. In addition an extra year or two, in order to brush up some special feature of the profession toward which his work leans, is desirable. It takes, therefore, ten years of study after high school before one is prepared to practice medicine. This represents a considerable outlay of capital and naturally there must be a proper return on this investment. If one is going to become a specialist there must be several years more of study which represents more investment of capital and calls for more return on the investment.

It is obvious, therefore, that if the community is going to be supplied with the best type of physicians it must expect to pay a considerable amount for them. Not only is the training of the physician expensive but with the advancement in knowledge the expenses of equipment for proper diagnostic procedure and proper treatment are steadily rising. It seems evident, therefore, that proper medical care as time goes on is going to cost steadily more.

This improvement in the products of medical

education despite the increased cost for the public has, however, its bright side so far as the economics of medicine is concerned in that the better trained physician and specialist should be able to save the public considerable expenditure of time and money in certain ways. For example, the well-trained physician should be able to make a proper diagnosis himself without using numerous and expensive specialists. Also this well-trained physician should be able to educate his own patients in the problems of public health and preventive medicine, so that the incidence of disease in the individual should decrease. These better-trained physicians will be able to diminish the extraordinary use of needless medication and expensive forms of therapy which are employed at the present time. Also it is expected that by means of the well-trained physician the public will gradually be educated up to the fact that tremendous amounts of money are spent by individuals in purchasing directly from the pharmacist drugs which are of no real importance in the treatment of their symptoms or diseases.

As time goes on there will be better automobiles built at cheaper prices, but to produce a better doctor it seems almost certain that the expenses will be greater. The saving to the public must come through the education of the layman and the improvement in the service by the physicians.

Dr. Richard M. Smith: Some of the things that I have to say have been referred to already and discussed better than I shall be able to present them. What I have to say will be in the way of emphasis of certain points. One might ask in the beginning, why is there all this talk on the costs of medical care? Why are not things all right as they are? Why not leave them alone? Perhaps from the point of view of many practising physicians that would be a very desirable thing to do, but I think that we will realize from the statements which have been made that the general public are not quite of that opinion, that there are certain things with reference to the cost of illness which to them, at least, are unsatisfactory. This is an opportunity for the display of leadership in the medical profession which is necessary for a satisfactory conclusion.

What are the things which have led to the present situation? Certainly the discussion of the costs of medical care does not imply a general indictment of the medical profession because there is still confidence in the medical profession by the great majority of people. The difficulty comes in the delivery of medical service, service of a quality which will continue to command confidence. Formerly it was easy for the general practitioner or the physician in general practice to deliver to his patients the kind of medical service which they felt was satisfactory. In the complexity of modern medical practice this becomes increasingly difficult. The demand for certain types of service which are expensive and which are difficult to render is increasing more and more so that when the consumer, the general public, goes to the doctor and gets less than he expects he is not satisfied. As a result, he consults a specialist of his own choice expecting that because he is called "specialist" he is going to get better service, but in fact it may be not so good; but whatever happens the service which he gets costs him a good deal more money. Because of that he finds it more difficult to pay his bills.

It has been stated that 85% of all preventive and curative measures which are needed for the treatment of people can be furnished by the general practitioner. It is undoubtedly true that adequate service can be rendered by the general practitioner but frequently only partial service is given. This has driven the patient from one specialist to another making the total bill beyond the capacity of the individual to pay. As a result such persons resort to free clinics, part pay clinics, or the physician has to furnish care for nothing. They go to the so-called irregular practitioner, spending $120,000,000 a year, or they buy patent medicines spending $320,000,000 to $360,000,000 a year, and in the end are no better off than when they started.

Over 75% of illness and the usual preventive measures can be paid for under the present system of medical practice. This, however, implies that care shall be given for at least 85% of these conditions by the general practitioner. Adequacy of care on the part of the general practitioner must go hand in hand with this responsibility. We must strive constantly to render better and better service. We have in the past advanced very slowly in the field of preventive medicine. A recent survey shows a notable lack in the ordinary preventive measures that are used in children of pre-school age. In none of the 146 cities surveyed by the Committee of the White House Conference on Child Health and Protection was it found that over 50% of these children had been vaccinated. In Boston only 33% of the children are vaccinated and only 14% have been immunized against diphtheria.

We said that 75% of illness can be taken care of in the ordinary family budget but the remaining 25% cannot be met from the yearly income. In order to meet this 25% there are two things we can do; we can either reduce cost or provide some satisfactory method of payment, or both.

In order to reduce the cost we have to understand a little about the items which go into the cost; physicians' services, hospital bills, nurses' services, medicines, and so forth. It was shown in a recent study in Philadelphia that about 26% of the total money spent on medical care goes for the cost of physicians, drugs 20.4%, hospitals 28.4%, dentists 12.6%, nurses 3.6%, other prac-

titioners 2.9%, and miscellaneous about 5%. It is obvious that if we are to reduce the cost it cannot be any reduction of physicians' fees except in exceptional instances because the average income of physicians is not high. Dr. Frothingham has spoken to you of the capital investment in medical education. There is an expenditure of $7,000 to $10,000. A recent survey showed that the average income of physicians in Philadelphia is about $5,000 and 40% of the gross income goes to overhead. Therefore, the physician receives only about 60% of what he earns. Probably in the 40% overhead some economy can be accomplished, as by the grouping of physicians in order to have the common use of office facilities, and so forth, but the reduction in the costs of medical care cannot come by a reduction of physicians' incomes because these incomes already are quite low enough.

I have in my pocket a copy of an interesting letter, which was sent to one of the persons associated with this Committee from a very intelligent and well-informed individual who has been following the work of the Committee and contributed considerably to it, which protests against the reduction of physicians' fees. This shows appreciation on the part of a lay individual of the necessity of finding some method of reducing cost other than the reduction of medical fees.

Undoubtedly, there could be a considerable saving in the cost of medicines. $715,000,000 a year are spent in this country. There is a great deal of unnecessary medication; also, much use of unnecessary appliances (ultra-violet lamps, for instance, which, although they may have some value are greatly overrated). Over-hospitalization is an important item in expense. There are factors which may be reduced.

There may also be ways of providing better methods of payment for medical care. There ought to be a way to conserve available resources of patients by educating them to go to competent adequately trained general practitioners instead of shopping around among specialists. The possibility of providing payment through group insurance is to be considered, as also the distribution of costs over length of time and among numbers of people, or even by taxation. We must recognize the fact that there must be found some way to reduce the cost of medical service by better organization and to provide some adequate method of payment.

Dr. William R. P. Emerson: Dr. Welch has said that our medical and health knowledge is very great but its distribution is pitifully small.

The truth of this statement is proved by the fact, as stated by the Insurance Companies, that life after the age of thirty-five has not been prolonged a single year during the past century. Neither has physical unfitness been decreased in the past twenty-five years. This situation, it seems to me, has an important bearing on the income of the physician.

The individual who desires both medical and health knowledge has no direct and simple method of getting the help that he so greatly needs. There are two barriers. The first is that the patient must decide that he is sick before seeking the doctor. He compromises by going to the drugstore, thus accounting for the expenditure by the public of $715,000,000 yearly for drugs—an amount larger than that expended for all medical work combined. The second barrier is that if he decides that he needs the doctor he again compromises for fear of the expense.

This situation in regard to medical service is similar to that in regard to repairs on an automobile. If our car does not run right we go to a "tester," who at very little expense, tells us whether the car really needs to go to the shop for repairs, or only needs a simple adjustment. In the medical field there is need of similar "testing" which can be supplied by health service stations equipped with a personnel thoroughly trained in health diagnosis, to which a person may go to find out whether he needs a simple health adjustment or to be sent to the physician.

The average so-called healthy person has from three to four conditions needing medical attention which would amount to over $50.00 per person, but the two barriers I have mentioned prevent the patient from reaching the physician. In the out-patient department, the patient is usually treated for several conditions other than that which brought him in. The establishment of a point of contact, such as I have mentioned, between the public and the physician, eliminates an enormous waste and would, I believe, straighten out the anomalous situation that now exists, on the one hand, of the great need of personal medical and health service, and on the other, of an abundant supply of such service which suffers for lack of distribution.

Dr. Charles E. Mongan: I have listened with a great deal of pleasure this evening to Dr. Davis. This is not the first time that I have had an opportunity of hearing him. Some fifteen years ago, Dr. Davis and I discussed many times from the same platform a subject somewhat allied with the one under consideration. Tonight he made a statement which I think is fundamental with this discussion. Dr. Davis said, among other things, that the burden of the cost of medical care is unevenly distributed. Is there any way, I ask, by which this burden might be evenly distributed? The question immediately arises, "Who is responsible for bearing the burden of the cost of medical care?" Is it the individual who should bear the burden of the cost of his individual medical care, or is it the com-

munity that should bear the whole burden of the cost of medical care, and I use the word community in its most comprehensive sense. This is not a new question, for this question has been partly answered. For instance, the legislatures of the states of the United States have passed laws which say that the burden of the cost of sickness and injury arising in and out of employment must be borne by industry. It is needless to call the attention of this audience to the manner of caring for industrial accident and sickness cases under the law in Massachusetts and on the whole, I think the Workmen's Compensation Laws of Massachusetts are wisely and justly administered. Our public school system is another instance of the community bearing a great burden. It bears the burden of public education. Now, if it is answered in the affirmative that the community should bear the cost of medical care, then the care of the sick must be regulated by some such scheme as that which cares for the man or woman sick or injured in industry, but if the question is answered in the negative; that is, the community should not bear the cost of medical care, then some private scheme which will collaborate with the medical profession must be devised to work out the problem of the cost and administration of medical care in such a manner that the cost of the care given will not be too great for the individual to bear.

Dr. A. S. Begg: The public interest in matters of health is very evident and is obviously on the increase. This is shown by the enormous sums which have been given to medical institutions in the last few years, mostly from laymen. It is also evident from the legislative activities which have greatly extended the work of government health agencies. Then there is the large amount of space given by newspapers and magazines and the considerable number of books written for popular use. All appear to be read.

It seems to me that it is through such means that we can carry on the educational program which will be required to bring about a reasonable solution of the problem.

There is one feature from which we can get some encouragement. It is the physician himself who has been foremost in the study of this problem. He has been the first to point out existing defects and to contribute toward solution.

We are face to face with changing conditions in medicine as in all other phases of the social scheme. I have been trying for years to make this plain to my students. They are told of the necessity for them to have an interest in what is going on about them and not to neglect their duties as citizens. It is evident that many are alive to the situation, for in a recent study into the activities of the State Department of Health, the letters received indicated an appreciation of these changes.

There are some questions that occur to me after hearing Dr. Davis's figures.

1. How is the actual cost of medical care distributed? That is, amongst patients, government and philanthropy.

2. Are the cost figures based upon costs to patients or do they represent the costs of institutions?

3. In figuring costs of institutions, is any attempt made to estimate the value of the free services rendered by the staff?

Dr. Frederic A. Washburn: I came unprepared to speak. I congratulate the Chairman and the Committee upon securing our able and distinguished chief speaker who has given us so complete a study of this subject. I am not prepared to discuss this field broadly, but I have had a little experience in the last two years in the particular demonstration which we have tried to make at the Massachusetts General Hospital in the Baker Memorial. There are certain interesting things about that. Some of you know about them, and I presume you all know about them in a general way. Perhaps I may be permitted to elaborate them a little.

The Baker Memorial Hospital was built, as you all know, for people of moderate means, and an arrangement was made by the voluntary suggestion of the Staff that, in addition to trying to keep the hospital charges down to the minimum consistent with the best of care, the Staff would adopt, and did adopt and agree upon maximum and minimum charges for the different types of service. This was something the patient could count upon beforehand and know about what the cost would be not only for the hospital care but for the care of the physician and surgeon. Then again we have tried to see to it that the cost of special nursing has been kept down. We have given adequate, and perhaps more than adequate, floor nursing service and we have insisted upon it that the patient who has been admitted to this hospital because he is a person of moderate means was not to have a special nurse simply to hold his hand and not to have one unless it is absolutely necessary in the opinion of the physician and the administration for his care. We have established there a system of group nursing for those patients who need more individual attention than the floor nursing gives but who perhaps do not need the constant attention day and night of a special nurse. That group nursing has been so arranged that the cost is $7.50 a day to the patient for 24-hour service rather than the $15 which the special day and night nurse cost, allowing $6 for the nurse and $1.50 a day for board.

What has been the effect on the Staff? I am happy to say that the Staff, and I believe that

any one of them whom you ask would corroborate this statement, are more than satisfied with the success of this demonstration. In fact, during the last year of hard times at least four or five men have come to me and said, "Thank God for the Baker Memorial, it is the only real money we are getting these days." That means that the hospital has collected the doctor's bill; that it takes as great care to get it as it does to have the hospital bill paid. Frequently, it is paid in advance. The money is not frittered away for unnecessary special nursing or unnecessary services.

I believe that the demonstration that has been made at the Baker Memorial is an important one, but it doesn't go far enough, and I agree thoroughly with what Dr. Davis has said—that we must come to a system of insurance. I hope not in commercial companies who will make a lot of money and exploit the patients. I hope it can be done by organizing some company or group of public-spirited people who will conduct it without profit. There must be some way of spreading this cost so that a man of moderate means can be protected against sudden onset of severe illness, for the necessary hospital and medical charges. He should cover that calamity which may come to him just as he covers the calamity resulting from the burning of his house. I think this insurance is coming and I hope that it may come in Boston.

DR. MICHAEL M. DAVIS: I would like to say that in the past year I have had the privilege of speaking before a number of medical societies widely spread over the country and that there nowhere appeared a higher degree of unanimity and quiet than here.

Dr. Begg has asked what is meant by certain figures. The figure $3,250,000,000 for example, is an estimate of actual outlay by the people of this country. The figures are not estimates of values or costs, they are estimates of what is actually paid out, which is on the whole a more definite thing. This amount is expended by the people for these various services, not including the element of unpaid service rendered by physicians for office or hospital cases. The bulk of this outlay is paid for by individuals themselves from their own pockets. The cost of hospital service is partly paid for by individuals for care of themselves and in part is paid out of tax funds and a small amount by philanthropy. Very little comes from foundations. The total capital investment of all the foundations in the United States is comparatively small, only about one billion dollars. All the capital of all the foundations together would not pay for much more than one year of hospital service. For physician and dental services the bulk comes from individuals.

Dr. Emerson has suggested the use of a trained health worker. Is the use of a trained health worker, trained public health nurse, etc., an effective way for teaching the public, combined with liberal use of the radio and other forms of publicity? Trained health workers are indeed effective. The only trouble about the public health nurse and visiting social worker is that they are expensive. You have to have a trained person, and there cannot be effective educational work without taking time. The question of extending the use of such personal service is largely how rapidly we can persuade the public to put up money to meet the salaries of many more public health nurses and social workers than we have today.

As Dr. Frothingham has pointed out, the incomes of physicians seem to be revealing themselves. A very significant point also comes out of the studies which have been made, namely, that physicians' incomes are very uneven, particularly in the large cities. This is not so gratifying. A good many physicians are in the $3,000 net income class. Some of these, of course, are young physicians whose incomes are negative during the first few years. A considerable proportion of these physicians in small places are earning incomes which are too low for a man with the training required of a physician today. In the large cities there are too many doctors and in the small places there are too few.

We will not get very far in reducing fees. I hope people will not spend any less for medical care than they are now spending. I think they don't want to. I think people want to spend money for medical care. Most people faced with serious illness often seem willing to spend more than they can afford. People are ready to spend money for medical care and more money than they are now spending. That is the goal to work for. I believe that the most important means of getting people to spend more money is to make it possible for them to spend it systematically. In Germany, Austria, and England the total amount of money spent for medical service is much larger than it was before insurance was started. This enables well people to pay regularly against the day of sickness.

It may be that, as Dr. Smith said, 80 or 85 per cent of illness can be cared for by the general practitioner, but note that the remaining 15 per cent of illness costs about 50 per cent of the total, or as much as the 85 per cent. That unevenness is the source of most of the trouble. The high cost of some illnesses is an outstanding fact.

On another point raised by Dr. Smith, concerning medical organization, I might say that in some Middle Western cities of modest size, nearly all the medical profession are organized in group clinics. The patient becomes the patient of the group and is handled by the man who is most capable of handling him. An organization of professional men themselves can keep the specialist within control so long as the members

of the group can keep on agreeing among themselves. That is not always easy.

In public health and in private health, the question must be raised, in what way will preventive medicine be most readily paid for? Will people learn to secure it by paying a fee for it? Experience has indicated that it is very much harder to get people to pay for nonemergent things. It is a fair question whether or not personal hygiene can be put on a fee basis. If not, it will have to be paid for by public funds. There is no doubt the public is much more interested in health matters than a few years ago. It is expressing itself in one way by fussing about the whole question and in another way by requiring responsibility to be assumed by the Public Health Department. When the public wants something done, it is going to turn to some agency; that this will be a governmental one is the most obvious thing. The public's increasing interest in the problems of public health is going to cause increasing responsibility to devolve upon the Department of Public Health, unless some new agency is set up for the purpose.

I agree with Dr. Washburn that a commercial insurance company ought to have no place in the kind of insurance we are talking about. That isn't a good answer. I hope that medical insurance groups will avoid that expensive intrusion. Grace Hospital of Detroit two weeks ago opened a pavilion designed for patients of moderate means modelled exactly after the plan Dr. Washburn has referred to. Louisville, Kentucky, is talking about a similar venture.

The point has been mentioned again, regarding the part of the physician in the studies of medical economics. We started out in the Committee of the Costs of Medical Care by mapping out an initial program of studies, as to the expenditure of families for sickness, the incomes and expenses of practitioners and hospitals, the facilities and expenditures of communities, the organization of insurance projects or group clinics. Then we found that the kind of things to be studied required for the most part people who had suitable knowledge of economics and statistics, and knowledge of the organization of public health work. Hence, while physicians have been used largely in consulting capacities and for interpreting data, in the actual field work of these studies, physicians have not played a large part.

THE MANAGEMENT OF PERMANENT COLOSTOMIES

BY WILLIAM M. SHEDDEN, M.D.*

IT is a novel idea to the laity and to a great many doctors as well that an individual can live with comfort both socially and physically and continue to do his usual work though he has an abdominal colostomy. Ignorance of this fact is a stumbling block to adequate surgery in the treatment of cancer of the rectum and sigmoid. Of the reasons why abdominal colostomy should be urged in resection of rectal cancer, the two following seem to me to be the most important:

1. There is not the temptation on the part of the surgeon to save bowel at the expense of a wide excision of the growth.

2. Bowel incontinence can be much more adequately controlled from an abdominal colostomy than from an incompetent anal sphincter or a perineal or sacral fistula.

That patients can live very active lives and mingle with their fellows without fear of social ostracism after having submitted to a permanent colostomy may be illustrated by the following instances from my records:

1. Mr. F. W., a railroad brakeman, had a two-stage abdominoperineal resection of the rectum, February 1929, at the Faulkner Hospital. His occupation necessitates great activity, such as swinging off and on trains. The colostomy interferes in no way with his work.

2. Mr. H. B., a salesman, had a resection of the sigmoid with permanent colostomy, February 1930, at the Faulkner Hospital. He very often indulges in gymnastics, including the violent maneuver known as a "cartwheel". His business demands social contacts with individuals of all types. He has been assured that his colostomy has not made him obnoxious to his clients.

3. Mrs. A. B. J., a housewife, had a two-stage abdominoperineal resection of the rectum, March 1926, at the New England Baptist Hospital. She frequently attends dances and social functions, in which she participates actively. She is not embarrassed in any way by the colostomy.

The objections that have been made to an abdominal stoma are many. Among them are that it is uncertain in its function of discharging fecal material; that any apparatus devised to catch and retain the fecal material is noisome and uncomfortable; that the presence of such an apparatus limits physical activity; that the abdomen is constantly soiled; and, finally, that with an uncontrolled stoma it is not easy to handle diarrhea or constipation.

It is, unfortunately, true that only rarely does a colon evacuate itself via an abdominal stoma spontaneously and regularly once a day. Occasionally it will not function at all unless artificially aided. Most of these stomata discharge small fecal masses at frequent periods and at no definite time. Surgeons have occasionally left a long loop of descending colon leading to the stoma in the hope that it would act as a

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reservoir and thus allow a longer interval between evacuations. But this is not often successful and the operator is not infrequently distressed to find that such a loop has developed a habit of prolapsing through the stoma.

It would appear, therefore, that the opponents of colostomy have some ground on which to base their objections. The function of the stoma, however, can be adjusted and considerably improved by aperient foods, lubricants, a rearrangement of one's daily habits, enemata via the artificial opening and by wearing a proper colostomy apparatus. Cathartic medication is only rarely necessary.

I agree with those who state that the so-called colostomy belt with its rubber bag attachment is a highly unsatisfactory affair. The rubber absorbs and retains odors; the bag is not easy to clean; it has to be frequently renewed. The webbing of the belt itself not infrequently becomes soiled and is difficult to clean. It occasionally slides about on the abdomen causing an irritation of the stoma. It is often expensive and if, as many times happens, the patient finds he cannot wear it, he feels that he has thrown his money away and that the surgeon should have advised against this sort of an apparatus.

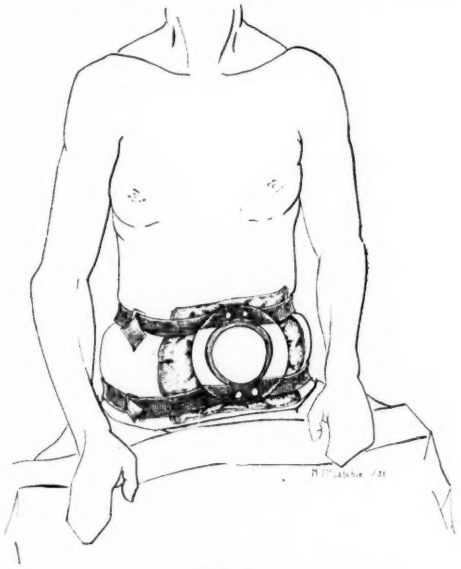

FIG. I.

In my experience, the best arrangement is a triple layered dressing surmounted by some supporting device. The dressing is made up as follows: first, a pad of absorbent material next to the skin. On top of this should be placed some sort of waterproofed material, then a thick pad to make firm pressure, and finally a support to hold the dressing in place. Many patients have employed for this last a wide abdominal belt made of rubber sheeting or some sort of a shallow cup or flat plate attached by straps. The wide belt is useful with patients who have a weak or protuberant abdominal wall.

The most satisfactory colostomy apparatus that I have seen is one devised by a patient of Dr. Arthur W. Allen of Boston. (See Fig. I.) Both Dr. Allen and the patient have kindly given me permission to describe it. It consists of a layer of specially prepared waterproofed paper sandwiched between two pads of cellucotton, the whole being held in place by a shallow aluminum plate about 15 cm. in diameter and shaped not unlike the overseas "tin-hat" of the A. E. F. This is held to the abdomen by two straps. Those of my patients who have used it have found it vastly superior to the old style colostomy belt with the rubber bag attachment. The simplicity of the apparatus has a distinct

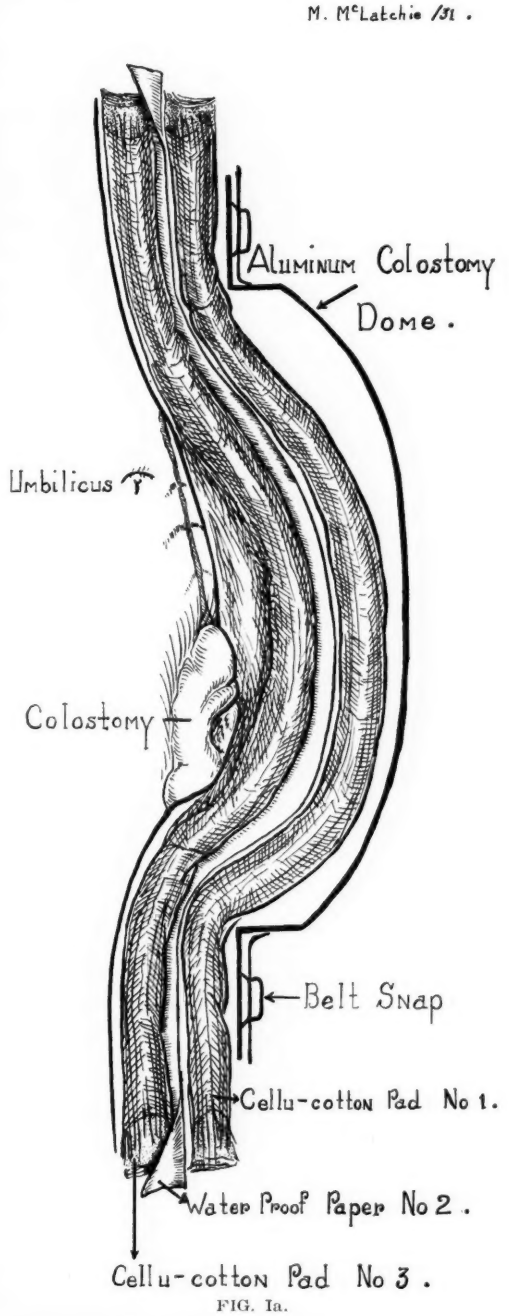

FIG. Ia.

appeal and when it is firmly applied to the body, odor from excreta is usually not noticeable. If a deodorant is desired, I would suggest spraying an aromatic germicide on the inner pad. There are several such in the market. The patient may also take a daily capsule of Kerol M III, which will tend to remove the odor from the feces.

Of course, if the stoma has been placed too near the ilium, pubis, or ribs, this type of metal support could not be used as it would impinge on those structures during motion of the trunk. If possible, the colostomy opening should be placed four to six centimeters below the umbilicus as it has been found that at this level the dressing can more easily be held in place and full motion of the trunk is not impeded.

The following scheme for the care of an abdominal anus has been evolved from personal experience with these cases, from the suggestions of others, including patients, and from the literature. Especially useful has been a little monograph on this subject by Lockhart-Mummery[1] in the *Lancet* for April 1931. The first part of the schedule is for those cases in which colostomy needs no irrigation. There are many in this group.

1. Have breakfast one-half to one hour before taking the morning bath. Peristaltic action may be hastened by including in the morning meal a cupful or two of hot liquid (coffee, tea or cocoa). Should constipation be stubborn, aperient foods or lubricants may be employed. The ingestion of mineral oil with or without agar tends to counteract sluggish bowel action. The addition of phenolphthalein, milk of magnesia, cascara, etc., is usually not necessary. Frequently all that is required to keep the bowels regular is the daily ingestion of a dish of stewed prunes. The following foods also tend to have a cathartic action:—figs, rhubarb, fruits stewed with sugar, oranges, grapefruit or lemon juice. The patient should drink liberally of water. It is to be remembered that thoroughly masticated food is less likely to cause constipation or diarrhea than food hastily eaten and improperly chewed.

2. Wash the body except in the region of the dressing.

3. Loosen colostomy apparatus.

4. Remove inner pad. If absorbent paper is used, this pad may be thrown into the toilet as it will be absorbed in the water. Nonabsorbable material may be deposited in a large paper bag for burning. The outer pad is usually not soiled because of the protection by the waterproof paper, as will be described below.

5. Clean the region of the stoma thoroughly with a pad moistened with warm water. If the patient has a tender skin, a bland powder or ointment may be applied afterwards. A very satisfactory unguent is a paste made of castor oil and zinc stearate powder.

6. Insert a clean dressing and tighten the apparatus again. Before going out to an afternoon or evening function, it would probably be wise to inspect the inner pad and replace it with a clean one if necessary.

The above program, however, does not suffice for all colostomy patients. Many require enemata and for these the following suggestions

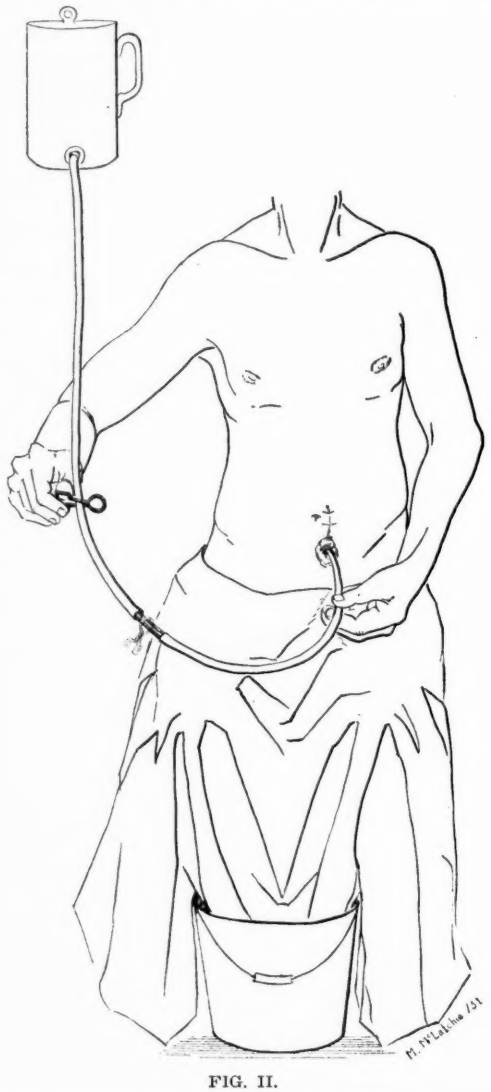

FIG. II.

will be found useful: This morning "washout" is best undertaken one-half to one hour after breakfast and just before the bath, for, if employed before breakfast the peristalsis induced by the ingestion of food will often start a postprandial flow of fecal material necessitating a second morning dressing. The technic is not difficult and, if thoroughly explained, can quite satisfactorily be conducted by the patient himself. (See Fig. II.)

1. Attach to a douche can of one or two-quart capacity about three feet of rubber tubing. The can is then hung to the wall about five feet from the floor.

2. To control the flow of fluid apply a clip

or similar device to the distal end of the tube and then fill the can with warm tap water. (Soap may be added if desired.)

3. Connect the rubber tubing to a rectal tube or catheter of a caliber about 28 Fr. (It is well to use the largest size tube that can be tolerated but it is possible that a smaller one than that indicated will have to be employed.) This connection may be accomplished with a two-inch section of glass pipe.

4. Lubricate the distal 8 or 9 cm. of the tube and, without using force, insert it into the stoma for its full length. If the catheter is checked in its progress, one of two things have probably occurred: (a) a hard lump of feces is blocking it, or (b) the tip of the catheter has become engaged in a fold of the intestine. To overcome this difficulty, withdraw the catheter a few centimeters and start the flow of

FIG. III.

fluid from the douche can by moving the clip on the rubber tubing forward till it rides on the glass connecting pipe and thus cannot close. With the fluid now pouring through the catheter, work it gently forward and backward in the colostomy. It will shortly be found that the fluid will wash aside the hard particles of feces or balloon out the fold of gut ahead of it and thus allow the catheter to proceed.

5. To prevent back flow of fluid from the colostomy a flange may be applied to the catheter. For this purpose I have found useful a rubber disc about 6 cm. in diameter and 1 cm. thick. A hole is bored in this disc, through which the catheter is inserted. Another simple method of obstructing backflow is to pack cellucotton about the colostomy. Usually, however, the backflow is not enough to be troublesome.

6. To protect the patient's body from soiling, a piece of rubber sheeting or other waterproof material may be fastened snugly around his waist and then allowed to drape over the edge of a pail placed between his feet. Down this the escaping water and feces may be allowed to course; or, after withdrawing the catheter, a male urinal, such as in common use in hospitals, may be held with its orifice over the colostomy in order to catch the excreta. (See Fig. III.) I have found this latter method the more effective, for sometimes the fluid shoots out of the stoma with some force and thus might spatter on the floor.

This "washing out" process will take from fifteen minutes to one hour, depending on the dexterity of the patient and the reaction time of the colon to irrigation. It will be found that if the scheme just described is followed, usually the patient will have no more fecal discharges until the next morning. Excessive peristalsis is occasionally annoying.

Should the patient be afflicted with a meal diarrhea, I suggest the following mixture:

Tincture Opium	20
Spirits Camphor	20
Spirits Peppermint	20
Tincture Capsicum	10
Tincture Rhubarb	10
Alcohol	20

Dose—30 m., which may be repeated in three hours.

The ingestion of plain, granulated agar will help in controlling the diarrhea if the attack is prolonged. The following bland foods may be employed during the excessive intestinal discharge: peptonized milk, toasted crackers, dry toast, barley or rice gruel, milk soups, cream of wheat, boiled rice, minced white meat of chicken. Avoid highly seasoned foods, excessive starches and sweets, and fatty foods.

CONCLUSION

It is hoped that these suggestions may help to make life more pleasant for individuals with abdominal colostomies. If patient and doctor will coöperate to work out a plan of management which suits the individual case, such a stoma can be taken care of without difficulty and we will have advanced a long way toward overcoming the prejudice against colostomy now held by most of the laity, and, unfortunately, by not a few doctors.

REFERENCE

1 Lockhart-Mummery, J. P.: Management of colostomy openings. Lancet 1:825-826, Apr. 11, 1931.

DECHOLIN-SODIUM IN CHOLECYSTOGRAPHY*

BY I. R. JANKELSON, M.D.,† AND W. S. ALTMAN, M.D.†

THE purpose of this communication is to introduce decholin-sodium as an aid to cholecystography. Decholin-sodium serves a twofold purpose: first, to accelerate the appearance of the gall bladder shadow; second, to increase the information obtainable from the routine examination by demonstrating the distensibility of the gall bladder wall. Decholin-sodium is a trade name for the sodium salt of dehydrocholic acid. It is marketed in sterile ampules of 5 and 20 per cent solutions for intravenous administration. This drug is a choleretic, increasing the quantity of bile excreted, although the concentration of the bile may be diminished. The action of decholin-sodium, when introduced intravenously is very prompt, lasting up to 90 minutes. In medicinal doses decholin-sodium is not toxic, causing no ill effects.

PLATE I. Gall Bladder filled three hours after the intravenous administration of tetraiodophenolphthalein and decholin-sodium.

Geling[1, 2] and Taterka[3] have demonstrated that good gall bladder shadows can be obtained within 3 hours after the intravenous administration of tetraiodophenolphthalein if a powerful choleretic is given at the same time, amongst other drugs they used decholin-sodium. The advantages of it are obvious, especially in out-patient department practice, when the dye can be administered at the clinic during the clinic hours and the patient kept there without incurring the expense and inconvenience of hospitalization. This routine has been used in our clinic both in the wards and out-patient department. The tetraiodophenolphthalein is given intravenously in the usual dose and is immediately followed by intravenous injection of 10 c.c. of 20 per cent decholin-sodium solution. The gall bladder shadow filled with tetraiodophenolphthalein is demonstrable on plates within 3 hours. (Plate No. I demonstrates a filled gall bladder 3 hours after the administration of the dye and decholin-sodium.)

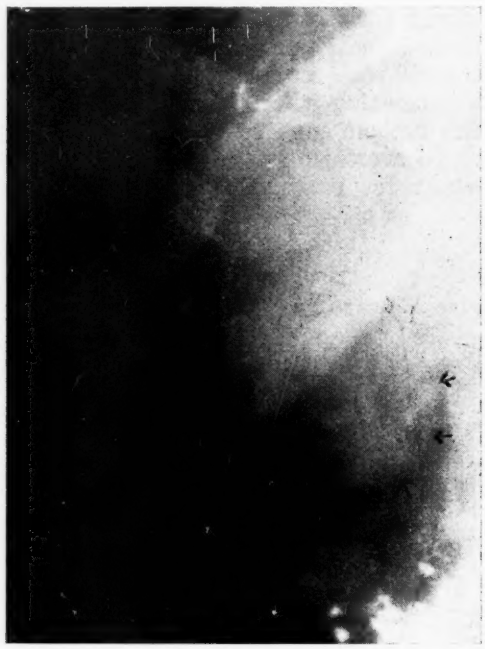

PLATE II. Gall bladder filled six hours after the oral administration of tetraiodophenolphthalein.

No reactions have been encountered from the intravenous administration of 10 c.c. of 20 per cent decholin-sodium solution except an unpleasant bitter taste in the mouth, which lasts but a few minutes. If the vein is missed and the decholin-sodium solution is introduced into the subcutaneous tissues there develop pain, swelling and redness which may last several hours to several days.

With the aid of decholin-sodium the gall bladder shadow can be visualized within 5 or 6 hours after the oral administration of the dye. For this purpose we use the following technic. The usual dose of tetraiodophenolphthalein is given in the morning instead of the night before. Four hours later 10 c.c. of 20 per cent decholin-sodium solution is given intravenously. The

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gall bladder filled with the dye can be demonstrated on plates within 1 to 2 hours afterwards. (Plate No. II demonstrates a gall bladder shadow

PLATE III. Gall bladder shadow barely perceivable 14 hours after the oral administration of tetraiodophenolphthalein.

PLATE IV. Same case: Fifteen minutes after decholin-sodium; note the dilated gall bladder and the stone within it.

5 hours after the oral administration of the dye when this technic is followed.)

Decholin-sodium may also be used in cholecystography for another purpose, to our mind more important and more valuable. When the dye is administered orally and the gall bladder is filled showing its size, shape and position, 10 c.c. of 20 per cent decholin-sodium solution is

PLATE V. Same case: Two hours after a fat-protein meal. Plates 30 and 45 minutes after decholin-sodium are omitted.

PLATE VI. Gall bladder filled 14 hours after tetraiodophenolphthalein by mouth.

administered intravenously. Due to the increased choleresis produced by this drug more bile and tetraiodophenolphthalein is excreted by the liver. Under these circumstances more bile reaches the gall bladder distending it and in-

creasing the size of it. This can be demonstrated on gall bladder plates within 15 minutes after the intravenous administration of

PLATE VII. Same case: 45 minutes after decholin-sodium; note very little enlargement of the shadow.

PLATE VIII. Same case: 2 hours after a fatty meal, very little concentration and emptying. Diagnosis: thickened gall bladder. At operation thickened gall bladder and 8 stones found.

decholin-sodium. The distention of the gall bladder is greater in 30 minutes and reaches its maximum in 45 minutes. (Plates III, IV and V.) This distention of the gall bladder is accompanied by a diminished intensity of the shadow of the fundus. There is also frequently a change in form and position of the gall bladder. A fat-

PLATE IX. Normally filled gall bladder after tetraiodophenolphthalein.

PLATE X. Same case: 45 minutes after decholin-sodium; note the size of the gall bladder as compared with plate IX. Plate after fat-protein meal omitted.

protein meal is then given and plates are taken to show the contractibility of the gall bladder.

In this way we may obtain greater information about the gall bladder than heretofore. The filling of the gall bladder demonstrates the patency of the cystic duct, the size, shape and position of the gall bladder. The distensibility of the gall bladder after the decholin-sodium

solution demonstrates the elasticity of the wall, the presence or absence of localized or generalized adhesions. The power to concentrate the dye is entirely a function of the mucosa of the gall bladder, while the contraction of the gall bladder after a fat-protein meal occurs as a result of muscular contraction of the gall bladder wall. With the aid of decholin-sodium we may thus obtain information about every coat of the gall bladder wall and its function.

There are other incidental findings after decholin-sodium. At times after oral administration of the dye there is some doubt whether the gall bladder is filled. Often in these cases the increased gall bladder shadow after decholin-sodium demonstrates a gall bladder which leaves no doubt about it. (Plates III and IV.) At times stones are demonstrated after intensity of the shadow is lessened or as a result of change in position of the gall bladder or gall stones within the gall bladder. (Plate IV.) Localized adhesions causing local deformity of the wall of the gall bladder may be demonstrated with greater certainty due to exaggeration of the deformity. At times repeat examinations are eliminated by exclusion of questionable pathology. However, in some cases where tetraiodophenolphthalein is given by mouth there may be no demonstrable filling of the gall bladder even after decholin-sodium and still the gall bladder may be normal as demonstrated by a repeat examination giving the dye either orally or intravenously.

The failure of the gall bladder shadow to increase in size after decholin-sodium is of diagnostic significance, denoting either failure of the liver to respond to stimulation or rigidity of the gall bladder wall. (Plates VI, VII and VIII.) It was shown by Sterner and his coworkers[4] that the liver under metabolic conditions reacts to intravenously administered decholin-sodium by excreting a greatly increased amount of bile for a half hour or longer. Serious liver pathology can be excluded clinically as well as from the fact that it can excrete tetraiodophenolphthalein in sufficient quantities to permit the visualization of the gall bladder. From theoretical considerations we may consider the possibility of a patent sphincter of Oddi permitting the escape of bile and dye directly into the duodenum thus failing to distend the gall bladder. However, under these circumstances the gall bladder would not fill with the dye either. Practically we may consider a gall bladder which fails to dilate after the administration of decholin-sodium if it filled with the dye originally, as one with thickened rigid walls.

Our experience with decholin-sodium has also taught us that the size of the gall bladder as demonstrated by roentgen rays is entirely accidental at the particular time, as under variable conditions its size may increase or diminish. The same may be applied to a certain extent to the shape and position of the organ, as both vary with distention under decholin-sodium. These points, and the influence of diet upon the gall bladder size, shape and position are being studied at the present time.

For routine studies of gall bladder outline and function after the oral administration of tetraiodophenolphthalein the following technic is recommended: The dye is given in the usual way, namely, the preceding evening two hours after a light meal. Skiagrams are taken 14 hours later. Then 10 c.c. of 20 per cent decholin-sodium is given intravenously, the patient being under metabolic conditions. Other skiagrams are taken at the end of 45 minutes. (Plates IX and X.) Then a fatty meal is given and plates taken 2 hours later. Plates 15 and 30 minutes after the intravenous administration of decholin-sodium may be dispensed with in routine examinations. Even when the gall bladder is seemingly not visualized after the oral administration of the dye decholin-sodium should be administered, as in a small per cent of these cases the gall bladder may still be visualized as a result of the choleresis produced by the drug. All plates must be taken with the same technic, same tube, same focal distance in order to note any variation in the density and size of the shadows. Poor technic and unsatisfactory plates do not permit accurate interpretation or diagnosis.

SUMMARY

A satisfactory gall bladder shadow may be obtained in three hours after intravenously administered tetraiodophenolphthalein with the aid of decholin-sodium. The gall bladder may be filled with tetraiodophenolphthalein by mouth within five hours with the aid of decholin-sodium. Decholin-sodium may be safely used, according to the technic described, in order to enlarge the gall bladder shadow produced by tetraiodophenolphthalein. Failure to demonstrate increase in size of the gall bladder outline within 15-45 minutes after administration of decholin-sodium is evidence, in the absence of serious liver pathology, that the gall bladder has lost its normal capacity to enlarge with the ingress of bile.

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ACUTE SALPINGITIS IN PREGNANCY

BY JOHN D. STEWART, M.D.*

ACUTE salpingitis is a rare complication in pregnancy, and the subject has received little attention in the medical journals and textbooks. The complication is serious, however, as regards both the life of the patient and the successful outcome of the pregnancy. Two cases recently encountered, together with two cases gleaned from the hospital records, will serve to illustrate the subject. This discussion refers both to primary acute salpingitis and to acute exacerbation of chronic salpingitis.

CASE 1. S. H., a white, married woman of twenty-eight years, was admitted to the Emergency Ward with the complaint of severe pain in the lower abdomen of six hours' duration. The past history was negative. She had been married for six years. There were three healthy children, and there had been one miscarriage at two months, a year before the present illness. So far as she knew, neither she nor her husband had ever had venereal disease. Her last period occurred two months before admission and seemed normal. About four weeks before admission, she noticed a scanty leukorrheal discharge without urinary symptoms. Three days before coming to the hospital the patient suffered a transient dull ache in the lower abdomen, mostly on the left, and there was associated general malaise. On the evening before admission, the lower abdominal discomfort increased and she felt feverish. She was awakened on the morning of admission by violent intermittent pain in the left lower quadrant of the abdomen and in the lower lumbar region, without nausea, vomiting, or urinary symptoms. The pain lasted for about six hours with short intervals of relief, and the patient was fairly comfortable on arrival at the hospital. There had been no vaginal discharge, except as noted, no chill, no urinary disturbance, and her bowels were functioning normally.

At examination the patient's general condition appeared to be good. Her blood pressure was 115/70, her pulse rate 90. There was diffuse lower abdominal tenderness, definitely greater on the left, with muscle spasm, moderate distention, and occasional peristaltic sounds. The abdominal tenderness extended to the flanks. A scanty yellowish discharge was noted at the introitus. The cervix was somewhat thickened and softened, the uterus was soft and symmetrically enlarged to about the size of a grapefruit. Movement of the uterus and palpation in the vaults were painful, the tenderness being greater in the left vault. One examiner thought he felt a mass in the left vault. The rectal temperature was 100.6°F., the white count 25,000, the urine normal.

A tentative diagnosis of ruptured ectopic pregnancy was made despite the absence of definitely irregular bleeding. Acute salpingitis complicating pregnancy was considered, and likewise ovarian cyst with twisted pedicle. At operation a normal uterus, pregnant about two months, and an uninflamed appendix were found. Both fallopian tubes were swollen, congested, and dull red; the fimbriated openings were fibrin-covered and creamy pus issued freely from them. The ovaries were normal, a corpus luteum being noted on the left. The appendix, which lay near, was removed and the operation was concluded. Following operation the patient was kept morphinized and was treated for incipient peritonitis. She did well until the sixth day, when labor pains set in. Abortion followed. Her convalescence was otherwise uneventful, and she was discharged on the fourteenth day.

Five days after leaving, the patient returned to the hospital with a small abscess in her wound. Smears of the thin, sanguineous discharge showed numerous gram-negative intracellular and extracellular organisms, having the characteristic morphology and grouping of the gonococcus, and in almost pure culture. Repeated efforts to grow this microörganism, using special media and precautions as to heat and moisture, were fruitless. The bacterium was regarded by the bacteriologist as being, in all probability, the gonococcus, although conclusive proof through the use of differential media and agglutination tests could not be obtained, through failure of the organism to grow. The wound infection rapidly subsided under irrigation with solution of chlorinated soda and instillation of an organic silver compound into the wound.

A further complication in this case was persistent uterine bleeding, for which dilatation and curettage had to be performed four weeks after abortion.

CASE 2.—M. G., a married woman twenty-one years old, entered the hospital with the complaint of lower abdominal pain. The past history was largely negative. She had been married for four years. One pregnancy, three years before admission, terminated normally and the child was well. Her menstrual history was regular, the flowing normal; her last period ended six weeks before admission. There was no history of leukorrheal discharge or urinary symptoms, and venereal disease was denied. One hour before admission, while taking a douche, the patient was seized suddenly with a severe lower abdominal pain, "like a labor pain but worse". At the douching, she had noticed a scanty, bloody vaginal discharge. After fifteen minutes the pain became less severe and on admission the patient was fairly comfortable. There was slight nausea with the pain, but no vomiting, chill, intestinal or urinary symptoms. The patient did not believe herself pregnant.

At examination the patient's general appearance was normal and she was in no obvious distress. A small amount of turbid fluid could be expressed from each breast. There was diffuse tenderness and spasm throughout the lower abdomen, equal on both sides. Peristaltic sounds were few, but there was little distention. There was a small amount of bloody fluid at the introitus. The cervix was soft, thickened, and patulous; the uterus was somewhat enlarged, boggy, and tender on firm pressure. No masses were felt in the vaults, but there was diffuse moderate pelvic tenderness. The white cell count was 15,000, the temperature 100.2° F. by rectum, the pulse 90, the urine normal.

The preoperative diagnosis was extrauterine pregnancy; the postoperative diagnosis was normal pregnancy and acute salpingitis. The surgeon's note follows: "The history and physical findings were so typical of extra-uterine pregnancy that operation seemed imperative. Exploratory laparotomy disclosed early normal pregnancy and acute salpingitis. The tubes were not much thickened, but they were congested, and pus could be expressed from them. They were both adherent in the posterior cul-de-sac and covered with fibrin. After considerable discussion, it was considered best not to remove the tubes." Appendectomy was performed, as the appendix was

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easily exposed. Cultures of the pus from the fallopian tubes were sterile. The patient's convalescence was uneventful and she left the hospital within two weeks after the operation.

Two years later this patient returned to the hospital with acute intestinal obstruction. At operation, adhesions kinking the terminal ileum were severed. The patient had too long delayed treatment, however, and three days later she died. It was learned that the pregnancy of the previous admission had gone to term without incident and a healthy baby had been born. Subsequently the patient's health had been good until the onset of symptoms of intestinal obstruction.

CASE 3.—A. M. T., a white, married woman, twenty-one years of age entered the hospital with the chief complaint of lower abdominal pain. In the past her health had been fairly good. She had had an operation through the vagina for dysmenorrhea three years before with good results. Her menstrual history was normal except for pain associated with her periods before this operation. Her husband was well, the domestic relations satisfactory. A child, born sixteen months previously, was healthy. There had been one miscarriage at two months, six months before entry. Four weeks after this miscarriage curettage was done for uterine bleeding. A month before admission the patient began to be troubled with intermittent, moderately severe, lower abdominal pain, more pronounced on the right. There were no urinary or bowel symptoms. The pains became more severe, so that she was almost incapacitated. Soon after the onset of the pain, she noticed a mass in the middle of the lower abdomen, and this gradually increased in size. For five months, there had been irregular, sanious, vaginal discharge, but she charted her periods as usual, and bleeding which she thought represented her last period ended a week before admission.

On examination, the patient's general condition appeared to be excellent and she was comfortable. No abnormality in the heart or lungs was discovered. Her abdomen was somewhat distended, and in the midline above the pubes could be felt a movable, rounded mass about the size of a grapefruit and rather tender. No spasm was noted. On pelvic examination, no discharge was seen. The cervix was soft and thickened, and the examiner thought he could move the large mass discovered by abdominal palpation without moving the cervix. There was moderate tenderness in the vaults, but no adnexal masses could be felt. The breasts were normal, and no fluid could be expressed from the nipples. Her temperature was normal, the pulse rate 90. The preoperative diagnosis was fibroid uterus and ovarian cyst. Laparotomy was performed and the surgeon's notes were as follows: "A soft symmetrical tumor of the uterus the size of a small melon; marked engorgement of veins of broad ligaments; uterus typical of pregnancy. Adhesions in pouch of Douglas involving back of uterus. The right tube was the size of a sausage and was excised; the left tube was somewhat thickened. No drainage." The patient's convalescence was uninterrupted. After discharge, no further trace of her could be found, so the fate of the pregnancy and the subsequent history of the mother are unknown.

CASE 4—E. L., a forty-four year old married woman, was admitted to the hospital with the complaint of lower abdominal pain. The past history was essentially negative, her health previous to the present disturbance having been good. She had been married twenty-nine years; there had been fifteen normal pregnancies, and two miscarriages early in married life. The last labor had been three years before entry and was uncomplicated. The husband was living and in good health. Eight months before admission, the patient had been seized with sharp, diffuse abdominal pain accompanied by pain across the lower back. There was no chill, nausea, or vomiting. The patient was incapacitated for about two weeks, the pains gradually subsiding. Following this episode, she was troubled intermittently with low backache. Two weeks before admission, the patient was taken again with severe, diffuse abdominal pain, perhaps more marked in the lower abdomen, and associated with fever, chills, dysuria, frequency, and noticeable distention. There was no nausea or vomiting until two days before coming to the hospital. Her last few periods had been protracted, with increase in the amount of flowing, but there was no discharge of any kind between her menses. The last flowing ended six weeks before admission; at the time the next period was due, there was only slight staining.

The patient was obese and well developed. The breasts appeared to be normal. No abnormality in the chest was discovered; her blood pressure was 118/80. Across the lower abdomen, there was definite tenderness, most marked just above the pubis on the right, but without spasm. On palpation, a mass could be vaguely defined in the midline of the lower abdomen. The perineum was relaxed and torn; there was mild prolapse. The cervix was boggy. A fullness in the left vault was apparent. The body of the uterus could not be outlined, but a firm, irregular mass was felt in the midline posteriorly. There was diffuse pelvic tenderness, more marked on the left. The patient's temperature for three days was normal, the pulse rate steady at 70; the white cell count on admission was 14,000, the sedimentation rate was moderately increased. The decision was to operate, the diagnosis being uterine fibroids and possible pregnancy.

The operation consisted of dilatation and curettage, followed by subtotal hysterectomy, with removal of the tubes and ovaries. The uterus was that of pregnancy of about four months' duration; there was a fibroid 6 cm. in diameter near the cervix; in the right vault was a tubo-ovarian abscess, and the uterus was bound down by posterior adhesions on the right. The pelvis was not drained.

The patient showed a marked reaction to the operation. On the fourth day, increasing distention, vomiting, and rise in the pulse rate set in. By the eighth day, the picture was in every way that of peritonitis and the patient died. Autopsy showed diffuse peritonitis, a streptococcus hemolyticus being grown from the fluid in the peritoneal cavity.

In addition to these cases, in the records of the Massachusetts General Hospital there are ten cases of pregnancy in which a complicating acute or subacute salpingitis was suspected but not proved, as the symptoms were mild and did not seem to warrant operation. The records further contain two cases of pregnancy and pelvic abscess, the origin of the infection in each instance being unknown, but possibly being the adnexa. In one of these, drainage was effected by posterior colpotomy; in the other by laparotomy. In two more cases, a diagnosis of chronic salpingitis and pregnancy was made on clinical evidence, but the diagnosis was not proved. The total, then, in our records is, four proved cases of tubal suppuration and pregnancy, two cases of pelvic abscess and probable

pregnancy, and twelve cases of supposed salpingitis and pregnancy.

The writers who have dealt with the subject of salpingitis arising during pregnancy are agreed on three points: the complication is rare; it is usually not recognized except at operation or autopsy; and it is dangerous. These ideas implicate, respectively, the departments of etiology, diagnosis and prognosis. As to treatment, there is some difference of opinion.

In 1917, Brindeau, in the only detailed report on the subject to be found in the literature, stated that he could collect ninety-seven instances of adnexal inflammation coëxisting with pregnancy, and of these twelve were his own[1]. In fewer than thirty-five instances, however, was the diagnosis established beyond doubt, as by operation or postmortem examination. Brindeau points out that these cases fall into two groups: those in which the tubal infection preceded conception, and those in which the tubal infection arose coincidently with, or subsequently to, impregnation. The latter sequence is much less common, and in most of the recorded cases the history contains evidence of infection antedating the pregnancy. However, in the first two cases noted above, the infection probably was acquired at the time of impregnation, or shortly afterwards.

There are four routes by which the fallopian tubes may become infected: by way of the endometrium; through the fimbriated extremities from the peritoneal cavity; through the wall of the tube, when it is involved in postinflammatory adhesions, as between the bowel and the tube; and through the bloodstream or lymphatics. The first is the usual portal of entry, and it is the only one which pregnancy closes. It sometimes happens that gonococci pass the cervical barrier and infect the decidua or even the fetus, and so produce abortion. Multiple small abscesses in the decidua containing gonococci have been observed by various workers, including Williams[14], but it is generally questioned whether the organisms ever pass on to the tubes by way of the uterine cavity during the course of pregnancy.

Inflammation of the tubes usually is bilateral and occlusive and hence leads to sterility. Occasionally, however, the patency of one or both tubes is preserved. Indeed, Holtz[18], in a study of 1083 cases of salpingitis in Scandinavian clinics, where expectant treatment was used, and where the follow-up system is unusually efficient, found that 12 per cent. of the married patients became pregnant following one attack of acute salpingitis. After more than one attack the incidence of pregnancy fell to 9 per cent. The diagnosis of acute salpingitis in these cases is only presumptive, however, as anatomic evidence obtained by operation or necropsy was lacking. The cases studied were only those in which the manifestations were less severe and in which the response to palliative therapy was favorable. The fulminating and refractory cases were operated upon and had sterilizing operations performed, as a rule. Obliteration of the tubal lumen is probably more common in gonorrheal salpingitis, where the infection primarily involves the inner lining of the tubes, than in salpingitis due to the staphylococcus, streptococcus, or colon bacillus, where the process is primarily perisalpingeal. The frequency with which the gonococcus is the offending organism in the initial infection is given by different authorities as from 40 to 80 per cent.

Acute salpingitis secondary to acute appendicitis exemplifies the infection of the tube through the intraperitoneal ostium. This is an occasional occurrence, emphasized by W. P. Graves, and at operation for acute appendicitis, a gangrenous appendix may be found lying glued to the fimbriated extremity of the right tube, the tube being definitely inflamed also. French writers speak of the appendiculo-ovarian ligament of Clado, whereby such infection of the right tube is facilitated. The left tube might be spared in these cases and maintain the woman's fertility after destruction of the other tube. Such secondary salpingitis may arise also after pelvic peritonitis from other causes, as perforation of diverticula of the colon, or perforation of peptic ulcer.

Infection by extension through the tube wall is probably chiefly seen in the secondary invasion of tubes by bacteria from the intestines after previous inflammation of the tubes has created adhesions involving the intestinal wall. The secondary invaders, such as the staphylococcus, streptococcus, or colon bacillus, die out more slowly than does the gonococcus, although in time the contents of the distended tube may undergo auto-sterilization in the case even of these organisms. It has been said that gonorrhea of the fallopian tubes is a self-limited disease, producing only one attack of pain and fever, and that the succeeding attacks are due to secondary infection[19]. The resultant mixed infection is more serious than is the gonococcal infection alone, as the organisms are more virulent and die out more slowly.

It is difficult to say how important a channel of infection the blood vessels and lymphatics are. The hematogenous route can be mentioned as a possibility, Brindeau[1] stating that tubal infection of such origin is seen particularly in "grippe" and an ill-defined febrile disturbance called by French writers "colibacillose". Brindeau believes that tuberculous salpingitis may be of hematogenous origin. Incidentally, he could find reports of only five cases of tuberculosis of the fallopian tubes complicating pregnancy. It may be that the superimposed organisms in mixed tubal inflammation are at times

brought to the pyosalpinx through the blood vessels.

Besides those cases of acute salpingitis in pregnancy where the bacteria gain entrance to the tubes through some channel other than the uterus, some are undoubtedly due to infection of the woman with gonorrhea at the time of impregnation. This probably occurred in the first two cases cited above, inasmuch as nothing in the history suggested previous salpingitis or gonorrhea, and yet at operation there was found acute bilateral salpingitis with pus exuding from the fimbriated ends,—without much question gonococcal infection. In both instances cultures of pus from the tubes were negative. The first patient developed a complicating wound infection, probably gonorrheal.

On theoretical grounds, then, one would expect acute salpingitis to be rare in pregnancy, for the tubes are usually infected through the uterus and in pregnancy this avenue is closed. The cases encountered would probably fall into the following groups,—acute exacerbation of chronic salpingitis in which the lumen of at least one tube had not been obliterated; primary acute salpingitis in which the bacteria gain entrance to the tubes through the free ends of the tubes or through the bloodstream or lymphatics; primary acute salpingitis of gonorrheal origin, the gonorrheal infection having been acquired at the time of impregnation. However, practically it may be said that salpingitis prevents impregnation and pregnancy, until ended, prevents salpingitis.

The diagnosis of acute manifestations of salpingitis appearing during pregnancy is not often achieved, although the pregnancy is usually recognized. A study of the recorded cases shows that the symptoms of a complicating salpingitis most often arise during the third, second, and fourth months of pregnancy, and by this time the signs of pregnancy are clear. Elements in the differential diagnosis are acute appendicitis, ruptured ectopic pregnancy, ovarian cyst with twisted pedicle, incarcerated pregnant uterus, pelvic sepsis following attempt to produce abortion, and necrotic fibroid. In two of the cases detailed above the preoperative diagnosis was ruptured tubal pregnancy. In one of these, acute salpingitis complicating normal pregnancy was considered a rather remote possibility; in the other, the findings were thought to be so typical of ruptured extrauterine pregnancy that operation was performed as an emergency measure. Both of these patients unquestionably were having initial attacks of acute salpingitis. In one case, the bloody vaginal discharge was urgent evidence in favor of ectopic pregnancy. In the last two cases, the preoperative diagnosis was fibroids, with a complicating ovarian cyst in the first, and with a suspicion of pregnancy in the second. These patients were suffering from milder manifestations of salpingitis, their symptoms denoting a flare-up of chronic tubal infection. Adnexal masses were palpable in the last two cases.

De Lee[2] states that "in all cases of acute peritonitis in early pregnancy, criminal practices are first to be thought of, and the abdomen is to be opened at once". This is a very definite consideration, and, in fact, pelvic peritonitis following attempt to produce abortion was the diagnosis most favored by a surgical consultant in the first case detailed above.

In general it may be said that the acute manifestations of tubal infection in pregnancy are the same as in the non-pregnant. The difficulty in recognizing the condition comes from the rarity of the combination and the failure of the examiner to think of it. At the same time, other complications of pregnancy producing a similar clinical picture are much more common. The diagnosis made will depend on variable factors, such as the severity of the peritonitis, the size of the uterus, the presence or absence of adnexal masses, irregular bleeding, and a history of previous attacks of salpingitis or of gonorrhea. The most important considerations in diagnosis are acute appendicitis, ruptured ectopic pregnancy, and twisted ovarian cyst; but the treatment of choice in each condition is operative.

As to the proper treatment of suppurative adnexitis in a pregnant patient, opinion is divided. Lewis[3] and Martius[4] are among those who believe that manifestations of acute salpingitis call for operative treatment no more during pregnancy than under other circumstances. Reynolds and Newell[5], Davis[6], and Shears[7] incline to operative interference. Kräuter[8], De Lee[9] and Schlink[10] advocate surgical treatment of the condition. Brindeau[1] and Bar (quoted by Brindeau) believe that operation should be advised as soon as the diagnosis is made, or even if the combination is suspected. Where there exists a collection of pus, as in the pouch of Douglas, the indications to operate are unquestionable; the abscess should be drained, either by colpotomy or by laparotomy. The pressure of the enlarging uterus is almost sure to rupture such abscesses and a fatal peritonitis may quickly follow.

In most cases, the diagnosis of tubal suppuration complicating pregnancy will be made only by the scalpel of the surgeon or pathologist. In the event that the surgeon is wielding the scalpel, then the problem of proper treatment in this condition suddenly becomes very acute. Whether to close the abdomen without more ado, whether to remove one or both tubes and ovaries, whether to extirpate completely the uterus and adnexa, and whether to drain the pelvis are pressing considerations. The surgeon would be influenced in the decision whether or not to drain

the pelvis by such factors as the severity of the infection, the amount of pus, and the degree to which it is spread around the pelvis, the extensiveness of the operative procedure, the effectiveness of hemostasis, and whether a primary acute attack of salpingitis, probably gonorrheal, or an exacerbation of chronic inflammation, probably due to mixed infection, were being dealt with. Another factor would be the importance of preserving the pregnancy, for drainage increases the risk of miscarriage. Drainage is more imperative in the flare-up of salpingitis due to secondary invaders than in the early acute gonorrheal salpingitis. In the latter condition also, conservatism at operation is more justifiable. It is the extensive pelvic abscess with adhesions to the uterus, the acute symptoms of which are due to infection no longer gonorrheal, that particularly menaces the life of the pregnant woman and the fetus.

As an argument against removal of a pyosalpinx during pregnancy, it has been pointed out that in time tubal abscesses may sterilize themselves. Hyde (quoted by Polak[11]) has shown that in gonorrheal salpingitis the contained pus is sterile in from six weeks to three months. Secondary infection is common, however, and in a mixed flora the staphylococcus, streptococcus, and colon bacillus may retain their virulence for months. Granting, then, that in many cases the pus in an abscessed tube may become sterile, still, the gamble does not seem to represent sound judgment, since rupture of a pyosalpinx containing virulent organisms is disastrous. The increased likelihood of rupture of adnexal abscesses incident to pregnancy, then, must be borne in mind in determining the treatment and vitiates the soundness of the usual roborant treatment.

Diseased tubes and even ovaries can be excised without greatly increasing the danger of miscarriage if the uterus is not molested. Schlink[10] reports two cases illustrating this point. In one case acute manifestations of pyosalpingitis supervened in the third month of pregnancy; at laparotomy bilateral salpingo-öophorectomy was done with a minimum of disturbance to the uterus. The pregnancy continued to seven months, although there was bleeding at intervals with threatened miscarriage. The baby lived, however, and the mother had a normal convalescence. In the second case, acutely inflamed tubes were discovered at laparotomy in a patient pregnant two months. Both tubes and one ovary were excised, the pregnancy continued to term, and a healthy child was born. The mother's puerperium was uneventful. (In this case it was not noted whether the ovary spared contained the corpus luteum.)

When a pelvic abscess of some size is encountered at operation, or the manifestation of infection is marked, such as elevation of temperature and pulse, pain, diffuse tenderness and spasm, and leucocytosis, hysterectomy with drainage should be considered. Late in pregnancy with threatening peritonitic symptoms, De Lee[9] recommends the Porro operation with supravaginal hysterectomy and fixation of the cervical stump in the lower angle of the abdominal wound. Whenever vaginal drainage can be done without laparotomy, as with an abscess pointing in the pouch of Douglas, posterior colpotomy is the procedure of choice. Brindeau[1] states that after rupture of a pelvic abscess by the enlarging uterus, only operation will save the patient otherwise doomed.

The operative procedure, then, must fit the individual case, remembering that undrained pus in the pelvis with a pregnant uterus jeopardizes the life of the patient, and that laparotomy and excision of a pus-tube may be done without greatly increasing the danger of miscarriage if gentleness is displayed in the technique. On the whole, when the patient is pregnant the surgeon should be reluctant to adopt the usual conservatism in dealing with salpingitis, without being influenced too much by the fact embodied in the observation of Maurice H. Richardson that it is easier for the surgeon to explain to the family why he operated than why he did not.

Blanc (quoted by Brindeau[1]), after studying a small group of cases, in some of which the coexistence of acute salpingitis and pregnancy was not proved, put the incidence of miscarriage at 55 per cent. and the maternal mortality at 62 per cent. Brindeau gives the incidence of miscarriage as 42 per cent. and the maternal mortality as 36 per cent. Brindeau's figures, like those of Blanc, are based on cases in many of which the diagnosis was unverified. Unfortunately both writers failed to consider separately the cases in which surgical treatment was given.

In the first two cases reported above, laparotomy with appendectomy was performed, the pelvic organs being left undisturbed; abortion followed a week later in the first case, but the patient survived, while in the second case the pregnancy went uneventfully to term. In the third case an abscessed tube was excised without drainage, and the patient's convalescence was satisfactory; the fate of the pregnancy was undetermined. In the fourth case bilateral salpingo-öophorectomy and supravaginal hysterectomy without drainage were performed, there being tubo-ovarian abscesses, and a pregnant uterus with fibroids; the patient died a week later of diffuse peritonitis. The second two cases probably represented acute exacerbation of chronic salpingitis during pregnancy. In no case was the diagnosis made before operation entirely correct.

In conclusion, acute salpingitis is a rare complication during pregnancy and the diagnosis is difficult; the complication is dangerous and surgical treatment is usually indicated.

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THE PROBLEM OF THE HANDICAPPED CHILD

In addition to many of the apparent difficulties under which children labor, the matter of defective hearing is found to be of considerable importance in the economics of education as applied to this class. It has been found that there are at least 3,000,000 school children in this country with more or less impaired hearing. Of this number, 18,000 are totally deaf. The mere element of diminished hearing aids materially to the cost of a child's education. It has been found that mentally dull children in many classrooms are those with impaired hearing and that this one item of expense in San Francisco alone amounted to at least $4,097, in one year, by reason of the necessity for repetitions in grade instruction to children thus handicapped. There are, however, problems of greater importance in the economics of education than that of the child handicapped by defective hearing, but this feature seems to be generally less well appreciated than some more obvious defects.

COÖPERATION WITH OFFICIAL AND UNOFFICIAL AGENCIES

In a report recently submitted to Congress, Surgeon General H. S. Cumming enumerates the various coöperative activities of the Public Health Service with official and unofficial agencies. These coöperative activities are numerous and varied. The report brings out that the Public Health Service has continued its extensive coöperation with other public health agencies, international, state, and local, as well as with private and voluntary organizations. In certain instances these coöperative activities are required by law, while in other cases they are considered essential for proper public health administration.

An interesting example of the form which such coöperation may take is indicated by the fact that the Board of Parole of the Department of Justice requested assistance from the Public Health Service in the preparation of a plan for additional treatment for discharged or paroled prisoners who were suffering from venereal diseases. The Public Health Service prepared and submitted a plan, which was designed to safeguard the public in the case of prisoners who were eligible for release or parole, but who were in the infectious stage of a venereal disease.

The record of the coöperative work between the Public Health Service and the various other official agencies and unofficial agencies includes every department of the Federal government and many voluntary and educational institutions. Another interesting example is the coöperative work of the Public Health Service with the Department of Commerce in the matter of standardizing procedures and administering regulations pertaining to aircraft arriving in the United States from foreign countries. Persons arriving in the United States in this manner must undergo the quarantine and health inspections just as do those who arrive by means of maritime craft.

There was also extensive coöperation with the various state and local health authorities; and through the vast coöperative activities of the Public Health Service much important work in the interest of public health has been accomplished.

AUTOMOBILE DEATH RATES

It has been generally believed that mortality due to the operation of automobiles is increasing and certain facts brought out by the Travelers Insurance Co. seem to substantiate that understanding. Reference is made repeatedly to the fact that mortality during the World War among the soldiers of this country was 50,510 and that 182,674 were wounded, but not mortally. In contrast to this 53,650 people were killed in automobile accidents last year and 1,576,840 were injured. The conclusions drawn by the Travelers Insurance Co. are that the deaths have increased 3.3 over 1930, although there was a smaller number of accidents. Severe injuries have likewise increased despite the reduction in the number of persons injured. This apparent contradiction is interpreted as being due to the increasing speed of modern automobiles as well as irregular methods of driving especially those of people not qualified to employ the high-grade automobile as a means of transportation. It is believed that drastic steps must be taken, if any improvement is to be brought about.

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 18151

TWO MONTHS' EPIGASTRIC PAIN WITH GAS AND NAUSEA

SURGICAL DEPARTMENT

First admission. An Irish wool factory operative fifty-six years old came in complaining of pain of two months' duration in a right scrotal hernia which he had had for twenty years.

Ever since he had had the hernia he had had occasional epigastric pain, gas and nausea relieved by manual reduction of the hernia and adjustment of the truss. Two months before admission he had onset of similar symptoms not relieved in that way. He had had blood in his stools for two years and difficulty in breathing for the past year. For a year he had had dyspnea. He urinated four or five times at night and had some dysuria on starting the stream. For two months his appetite had been poor, he had had eructations of gas and had felt tired. He continued to associate the hernia with his epigastric pain and therefore came for repair.

Repair of the hernia was done. The patient made an uneventful convalescence and was discharged in two weeks.

History of interval. After discharge from the hospital his symptoms increased somewhat in severity. At the Outpatient Department six weeks after his discharge he located the pain in the midline just below the umbilicus. It was somewhat though not entirely relieved by soda and the passage of gas and was made worse by food. He had lost 8 pounds in the past six months. During the next eleven days he lost 3 more pounds. He was afraid to eat because food aggravated the pain. He had also lost strength. The pain was dull and constant. It occasionally radiated along the right hypochondrium. Rarely he felt pain in the precordial region, momentary, not severe. The epigastric pain often kept him awake. It was more severe during or soon after eating. Occasionally it was aggravated just before eating. He sometimes passed a little bright red blood after stools. He had a history of hemorrhoids for years. His bowels had been constipated for years. There had been no recent change in his bowel habits. He had had some mild back pain. He had nausea about once a week but was able to restrain vomiting. During the past month his belching had increased markedly and he had had increasing difficulty in passing gas.

X-ray examination in the Outpatient Department a week before admission showed a constant filling defect which appeared to be annular in the region of the antrum of the stomach. The deformity extended over more than half of the stomach wall, giving an hourglass stomach. Reverse peristalsis was seen in the cardia and vigorous waves were seen distal to the filling defect.

Second admission, two months after his previous discharge.

Physical examination showed a spare man, slightly pale, complaining of epigastric pain. The heart showed no abnormality. The lungs showed distant breathing throughout. Abdominal examination showed just below the ribs to the left of the midline a suggestion of a mass descending on inspiration. There was tenderness in the epigastrium. The prostate was boggy. Otherwise the genitals, extremities, reflexes and pupils were normal.

Before operation the urine was not remarkable. Blood examination showed the hemoglobin 75 per cent, red cells 5,270,000, some variation in size and shape, white cells 2,900. The stool showed a positive guaiac. Gastric analysis showed 25 cubic centimeters of fasting contents of the stomach, opaque yellow fluid with much mucus and a very few solid particles. Guaiac was moderately positive. There was no free hydrochloric acid; total acid 1. Test meals at half an hour and one hour showed no free hydrochloric acid, total acid at half an hour 10, at one hour 7. The serum protein was 4.9. The non-protein nitrogen was 36.

The patient continued to have some pain relieved by soda.

The week after admission, operation was done. The patient was in very poor condition immediately after it, but soon rallied. The following day he complained of substernal pain only. Lavage gave 6 ounces of almost pure blood. The abdomen was board-like and his expression apprehensive. Three days after operation there was tenderness in the gutters of the abdomen and in the suprapubic region, increasing. Peristalsis was absent. At the right base were dullness and diminished bronchovesicular breath sounds.

X-ray examination showed the left side of the diaphragm obscured by dullness of the lung. The apex of the heart was also indistinct. The heart was displaced towards the left. The intercostal spaces on the left side were narrowed. The right side of the diaphragm was limited in excursion, in normal position. There was some increase in the width and density of the lung markings in the right lung root and at the right base. The upper parts of both lungs were clear.

The following morning the patient died.

Clinical Discussion

BY RICHARD C. CABOT, M.D., AND
GEORGE W. HOLMES, M.D.

NOTES ON THE HISTORY

Dr. Cabot: The fact that the patient's symptoms were apparently relieved by manual reduction of the hernia seems to me very interesting. I never have seen much of scrotal hernias, which go to surgeons rather than to internists, but I never heard before of epigastric pain, gas and nausea relieved by manual reduction of a hernia. He must have gone through it many times and got definite relief of the symptoms. Of course lesions low down in the intestine like cancer of the sigmoid quite often give gastric symptoms, and I suppose the mechanism in this case might be the same.

When we learn, however, that his symptoms increased after he left the hospital although the hernia had been eliminated as their cause, we begin to doubt whether there ever was any relation between them.

Dr. Holmes: We have a series of x-ray films here which show a constant annular filling defect in the midportion of the stomach, certainly rather typical of extensive carcinoma. The involved area extends from well up towards the cardiac orifice to the region of the antrum and the margins are mottled. The defect was constant in two films and constant throughout the fluoroscopic examination. Of course such an appearance is sometimes due to spasm. I do not see, however, how this can be due to anything other than carcinoma.

In the chest film we have a heart shadow extending to the left rather further than is normal. It lies rather horizontally in the chest. There is dullness throughout the lower part of the left lung obscuring the apex of the heart and the outline of the diaphragm. There is also some soft mottling in the lower part of the right lung. This I think should be interpreted as displacement of the heart to the left, with changes in the lung consistent with a terminal bronchopneumonia.

Dr. Cabot: The blood is not remarkable except for the rather low white cell count.

Have you any idea why they took the serum protein?

Dr. Fremont-Smith: Dr. Chester Jones is interested in anemia due to faulty diet. He has found that people with cancer of the stomach may have the serum protein reduced by eating a faulty diet with too little protein content.

Dr. Cabot: I have no doubt that operation was done for cancer of the stomach. The symptomatology is characteristic; the x-rays are characteristic; the dubiously palpable mass, the guaiac tests on the stomach contents and on the bowel contents,—we cannot ask for more evidence than that. I have no doubt that he had extensive carcinoma in the lower half of the stomach.

PREOPERATIVE DIAGNOSIS

Carcinoma of the stomach.

OPERATION

An extensive lesion was found involving the distal half of the stomach with involvement of the peritoneal coats but stopping short of the pylorus. There were no adhesions to the neighboring viscera. The liver was free. The left omentum contained a number of glands. The duodenum was severed and the ends closed in. The stomach was then resected, with removal of about two-thirds. After this had been done a nodule was found high up on the fundus beyond the resected area, so that another section of the stomach was removed, leaving only an area about two inches long and one inch wide. To this the jejunum was united by anterior gastro-enterostomy, the loop being brought up through the mesocolon. An entero-enterostomy was done between the afferent and efferent loops, also a jejunostomy below the site of the entero-enterostomy.

The operation was very difficult and took a long time. There was a moderate amount of leakage when the stump of the stomach was being sutured.

PATHOLOGIC REPORT

Carcinoma of the stomach with metastases to the regional lymph nodes.
Leiomyoma of the stomach.

Further Discussion

Dr. Cabot: When glands are found like that in the omentum they are quite often found on examination to be normal, not cancerous. The finding of such glands does not mean that it is hopeless to get the cancer out. I saw that in the Mayo Clinic they had 120 such cases of gastric cancer followed for several years with operation and cure. I have not seen any such cases myself, but I know there are a few around Boston. I am trying to accent the point that the finding of glands in the omentum at operation is no reason for giving up the operation. The finding of glands in the liver is. They did not find any in the liver apparently, so they did an extensive operation.

Of course cancer patients notoriously stand these long operations very badly.

There was also a leiomyoma of the stomach. What is that?

Dr. Mallory: An ordinary fibroid.

Dr. Cabot: It would not do any harm?

Dr. Mallory: Not at all. Minute ones can be found in 15 per cent of all autopsies. This nodule was a centimeter or so in size. We find them of that size in perhaps one out of every two hundred autopsies.

DR. HOLMES: The lesion in the stomach is said not to have involved the pylorus. In these films it certainly looked as if it extended to the pylorus.

DR. CABOT: I take it the final x-ray shows that he had massive collapse on the left. What about this atelectasis?

DR. HOLMES: I did not notice that when I was showing the films. The heart is not visible to the right of the spine and seems to be over to the left further than it should be. It seems that the interpretation of that should be that the heart was displaced to the left. The outline of the diaphragm is not distinct enough on this film for us to decide where it was.

DR. CABOT: What are the chances of being able to identify atelectasis at autopsy?

DR. MALLORY: One hundred per cent on that.

DR. CABOT: It is a thing that stays long enough to put a finger on. I will say then on general principles that he had it.

DIFFERENTIAL DIAGNOSIS

He died I take it of general peritonitis following an operation for cancer of the stomach. I should think it is a good guess that he had some atelectasis as well as bronchopneumonia of that left lung.

A STUDENT: How do you account for the high red cell count?

DR. CABOT: That is not high.

A STUDENT: It is normal, then?

DR. CABOT: Yes. We often get normal red counts with no acid in the stomach in gastric cancer, we do not know why. It is much more natural to ask why it is ever low. If we take any large series of gastric cases, many of them have normal red counts.

A STUDENT: There is no explanation?

DR. CABOT: None.

A STUDENT: What are the chances here that he had hemorrhage? Would there have been board-like rigidity if he had hemorrhage?

DR. CABOT: There is no doubt that he had hemorrhage, but I have never heard of this sort of abdomen's being due to hemorrhage. I suppose that with hemorrhage under these conditions there would be leaking of something else besides blood and so we should get peritonitis. It is quite possible that there is some blood in the abdomen, but I believe there is something else there besides blood.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Carcinoma of the stomach.

DR. RICHARD C. CABOT'S DIAGNOSES

Carcinoma of the stomach.
General peritonitis.
Bronchopneumonia of the left lung.
Atelectasis of the left lung.

ANATOMIC DIAGNOSES

1. *Primary diseases.*

(Carcinoma of the stomach.)
Ulcer of the stomach with perforation.

2. *Secondary or terminal lesions.*

Acute general peritonitis.
Marked congestion and probable multiple infarcts of the left lung.
Arteriosclerosis.
Coronary sclerosis.
Luetic aortitis.
Operative wounds, subtotal gastrectomy, entero-enterostomy, gastro-enterostomy, jejunostomy (recent), herniorrhaphy, old.

3. *Historical landmarks.*

Adenocarcinoma of the kidney.
Healed pulmonary tuberculosis.
Leukoplakia of the esophagus.
Cholesterosis of the gall bladder.
Chronic splenitis.
Focal areas of calcification in the liver.
Varicocele of the left testicle.
Hydrocele, slight, right testicle.

PATHOLOGIC DISCUSSION

DR. MALLORY: We found general peritonitis. The cause of it however was rather a surprise. Usually in these cases we find no obvious reason for the development of peritonitis. It is of course possible after any operation upon the intestinal tract. Sepsis may occur because of slight spilling of the intestinal contents during operation. In certain cases the suture lines break down through localized infection of the gastric wall and an obvious leakage occurs there. Sometimes the tissues seem to lose vitality simply from handling. In this case there was a definite perforation of the stomach about one centimeter and a half from the gastro-enterostomy, the result apparently of a very acute ulcer. I have no idea as to its etiology.

The lungs showed an infarct at the left base rather than merely collapse. I think there was a certain degree of collapse too.

DR. HOLMES: There is usually some collapse with an infarct, isn't there?

DR. MALLORY: Yes, almost always.

The heart was quite small. There was a localized area of luetic aortitis, or rather there was a luetic aortitis with a localized area of outpocketing about one centimeter and a half in diameter just above the aortic valve, but it was so small that I think it would have been impossible to pick it up at this early stage.

In the lower pole of his left kidney he had a hypernephroma, or an adenocarcinoma at any rate, which quite certainly was not metastasis from the stomach, but a second primary malig-

nant tumor. So that even if he had survived his gastric lesion I think he would not have had many years of life before this second cancer of the kidney would have killed him.

CASE 18152

THIRTY-FIVE YEARS' JAUNDICE AND EPIGASTRIC PAIN

Surgical Department

PRESENTATION OF CASE

Dr. John L. Newell*: This patient was a sixty-five year old married English stationary fireman who came into the Medical wards in the middle of February. His story went back to the age of thirty, and was briefly this:

He had severe epigastric pains several times a year. Twenty-four hours following these he had slight jaundice which would clear up after four or five days. During the past year and especially during the past six months he had had more frequent and longer attacks of more severe pain, so that the jaundice did not clear up between attacks. Some months before admission he had a positive Graham test in the Outpatient Department. A gastro-intestinal series was negative.

On physical examination he was well nourished. There was nothing abnormal except a tender palpable liver edge which was three fingerbreadths below the costal margin. He was moderately jaundiced.

The laboratory work was normal in every respect except for a van den Bergh of 3.5 and an icteric index of about 20.

He was seen in consultation by the Surgical service. It was decided that he had gall bladder disease. He was transferred and operation was done. At operation it was found that he had severe cirrhosis of the liver and an infected gall bladder with stones.

He was sent back to the ward in good condition and remained in good condition for the next twenty-four hours. On the following afternoon, however, he began to have increased pulse and respiration and there was marked tenderness over the upper abdomen. We suspected that there might be bile peritonitis, as no bile had drained from the catheter in the common duct, or else that there might be bleeding. We could find no evidence of either one. He was transfused, but grew steadily worse, became drowsy, then comatose, and died early the next morning, thirty-six hours after operation.

Clinical Discussion

Dr. Wyman Whittemore: As I remember the operation the condition of the liver was troublesome to me, so that we sent for Dr. Bradley to come over to see it. It seemed hard and more or less irregular. The gall bladder itself was thickened and had one very big stone in it. The question was, was there a stone in the common duct? At one time I got a slight impression that there was a soft stone somewhere in the hepatic ducts, not in the common duct itself. I took out the gall bladder and went into the common duct through the cystic duct. A little muddy detritus came out. Then I probed down into the duodenum and dilated the duct. The common duct itself seemed to be very short. I thought that by dilating the opening into the duodenum, if there was any small particle or stone it would be very likely to go through into the duodenum. The common duct was drained with a catheter.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Cholecystitis.
Cholelithiasis.

ANATOMIC DIAGNOSES

Cholelithiasis.
Biliary cirrhosis.
Collapse of the lower lobes of both lungs.
Adherent pericardium.
Acute enteritis.

Pathologic Discussion

Dr. Tracy B. Mallory: This man had, as Dr. Newell told us, a thirty-five year story of upper abdominal pain and recently had been jaundiced. Of course it was a typical story of gall bladder disease, but with gall bladder disease of that duration there is always the possibility of cirrhosis. Either chronic infection of the bile ducts or chronic but not quite complete obstruction is perfectly capable of producing a very extensive biliary cirrhosis. That is what we found in this case.

The liver was larger than normal, though not so large as in many cases of biliary cirrhosis. It weighed 1800 grams, perhaps three or four hundred above normal for a man of his size. It was very hard and finely granular. Microscopically there was a well marked proliferation of the bile ducts and a quite marked acute polynuclear infiltration around the terminal proliferating bile ducts. In our experience here this is much the least common type of cirrhosis. We have had only three cases in the last twelve hundred autopsies. We have had a few more cases in which we felt fairly sure of the diagnosis clinically and in some instances have been able to confirm it by a biopsy from operation. As a cause of death, however, in the group of cases we have had here biliary cirrhosis has been distinctly uncommon.

The sections of the liver show that one is dealing with an extremely diffuse cirrhosis. Each

*Junior interne on the East Surgical service.

of the nodules of liver tissue is about the size of a normal lobule, but each one is surrounded by a definite zone of fibrous tissue. For the most part the central vein is still present in the lobule, though in some instances it has disappeared. In contrast, the other types of cirrhosis almost invariably lead to complete obliteration of the lobular architecture. One is dealing then only with nodules of regenerated liver tissue which no longer have the usual lobular arrangement. In many of these areas of fibrous tissue at the periphery of the lobule a marked new formation of bile ducts has occurred. In some cases they seem almost to be invading the lobule. In other places, about the long slender strands of new formed bile ducts there is a dense infiltration of polynuclears. It is an acutely progressive process and quite typical of biliary cirrhosis.

One other interesting thing was the bile ducts. The common bile duct seemed quite short and very much dilated. The cystic duct was also dilated. The hepatic duct was very long and ran all the way up to the liver before it branched. We found a single soft pigment stone lying in a shallow pocket of the common bile duct just at the entrance of the hepatic duct. It seemed to block the hepatic duct without to any extent blocking the cystic duct, so it would be very possible to pass a probe from the cystic into the common duct without touching it at all. He had unquestionably enough biliary obstruction within his liver from the infectious process there so that the additional slight obstruction from this stone was of no great significance. I should think that at the time of the final illness most of his symptomatology was probably due to the cirrhosis.

The other findings at autopsy seem to be more or less coincidental, had no very obvious relationship with his main disease and do not seem to explain the nature of his death. He had fairly extensive pulmonary collapse of both lower lobes. He had a very marked completely adherent pericardium from which so far as we could make out he had no symptoms at any time. He had a small area of acute enteritis in the small intestine with hemorrhage and thrombosis of a few of the mucosal vessels. I cannot connect that with the cirrhosis at all.

DR. CHESTER M. JONES: Have you any idea what the pathology or what the histologic picture is in the cases of long continued jaundice which apparently start with symptoms similar to those of catarrhal jaundice? I have a small group of cases which I have been following for five to ten years. There is jaundice all the time. The jaundice clears partially and then recurs. The liver is very frequently moderately enlarged, but not nearly so much as in the hypertrophic biliary cirrhosis. The patients tend to get progressively better as the years go by. Some of them end up with something quite comparable to this patient's condition, yet I have never, that I recall, seen an autopsy of one after the process had gone on for eight or ten years.

DR. MALLORY: I do not think we have had any cases comparable to that at autopsy. The history fits fairly well with Hanot's original description, except that the liver is not so markedly increased in size.

DR. LINCOLN DAVIS: In this case do you consider that the etiology of the cirrhosis was gall stones?

DR. MALLORY: I think it is very probable. Partial obstruction over a period of thirty-five years would very readily go with this type of cirrhosis. It is the one type of cirrhosis seen in man which we can readily produce experimentally in animals. We can produce other types of cirrhosis than this in animals, but they seem to bear no relation to the type of disease seen in man, whereas this type is very easy to produce.

DR. DAVIS: Do you think it is likely that there was a stone in the hepatic or the common duct for thirty-five years?

DR. MALLORY: I think it is very possible,—perhaps not the same stone all the time.

A SURGEON: Isn't it always obstructive jaundice?

DR. MALLORY: Yes. Perhaps the clearest examples we see of it in human beings are occasional cases of congenital atresia of the common bile duct where the obstruction is not complete. We had two or three such cases in the old hospital records here with very marked biliary cirrhosis. It may also occur without mechanical obstruction; that is, without either a stone or narrowing of the duct, simply as the result of ascending infection of the bile duct. I think infection is to a certain extent obstruction, at least may act as obstruction.

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FINDING THE OTHER CASE

THIS year, in view of the fact that on March 24, fifty years ago, Robert Koch announced before the Physiological Society of Berlin his discovery of the tubercle bacillus, the National Tuberculosis Association inaugurated on April 1 its Early Diagnosis Campaign. In this campaign and in its health education this year it is trying to emphasize that tuberculosis is spread by contact with one who has the disease, consequently its slogan for the campaign: Tuberculosis causes tuberculosis—Every case comes from another. The focal point of the educational work this year lies in instructing the public to rely on the physician, not only for the treatment of the individual case, but also for guidance in preventing the spread of tuberculosis to other members of the family.

Concerted efforts to reduce the toll of tuberculosis by applying modern methods to "find the other case" began on April 1, according to campaign plans. This involves the coöperation of tuberculosis associations, physicians, health officers, public health nurses, social workers and community leaders throughout the United States. Educational material in the form of circulars and pamphlets is available for the general public, for the physicians, for the health officer, for the public health nurse and for the social worker. Additional material includes outlines for talks at clubs, schools, churches and over the radio; a strip film, a motion picture trailer, lantern slides, billboard and wall posters, special feature articles and illustrations for magazines and house organs and plate matter for weekly newspapers.

AIR CONDITIONS AND THE COMFORT OF WORKERS

AN extremely valuable and interesting report has recently been issued by the Policyholders Service Bureau of the Metropolitan Life Insurance Company on air conditions and the comfort of workers. The majority of the conclusions are based on extensive investigations conducted jointly by the United States Public Health Service, the United States Bureau of Mines, and the Research Laboratory of the American Society of Heating and Ventilating Engineers, and more recently by the Harvard School of Public Health. These investigations have correlated the physiologic responses of the body to a wide variety of environmental temperature conditions and have determined as "effective temperature" the temperature, humidity and air motion combinations which give equal sensations of warmth or cold.

No single instrument has yet been devised to measure the combined effect of these three atmospheric factors—temperature, humidity and air movement. The ordinary mercury thermometer indicates the dry bulb temperature of the atmosphere. The whirled wet bulb thermometer or sling psychrometer measures the wet bulb temperature, from which can be computed the relative humidity, and by use of the anemometer or the kata-thermometer the velocity of air motion can be determined. The comfort of the human body is affected by the interrelation of all three factors; thus at high temperatures evaporation from the body, with increased comfort, is promoted by a low humidity and still further by increasing velocities of air motion. Conversely at low temperatures a relatively high humidity and decreased air velocity permit the body to conserve its heat.

Air cleanliness, for both comfort and health, needs also to be considered in certain industries and in cities; deviations in air pressure are considered only under such unusual circumstances as in aviation and mountain climbing or in diving and caisson work.

The interrelationship of the factors of dry bulb temperature and humidity have been made

into a comfort zone chart in which, for wintertime, the combinations of the physical properties of the air lying along the line indicated as 66° effective temperature gave the most desirable sense of comfort to the large majority of individuals. The zone bounded by the lines marked 60° and 74° on the scale was found to be comfortable for several members of the group. During the summer season the zone shifts to higher temperatures, the probable cold limit being 64° effective temperature, the probable comfort line 70.5° and the probable warm limit 79° effective temperature. This chart applies to air movements between 15 and 25 feet per minute.

THIS WEEK'S ISSUE

Contains articles by the following named authors:

Taylor, E. W. A.M., M.D. Harvard University Medical School 1891. James Jackson Putnam Professor of Neurology, Emeritus, Harvard Medical School. His subject is Jacksonian Attacks and Brain Tumor. Page 771. Address: 457 Marlborough Street, Boston.

Whitehorn, J. C. A.B., M.D. Harvard University Medical School 1921. Director of Laboratories, McLean Hospital. Fellow, American Psychiatric Association. Member, National Research Council on the Division of Medical Sciences. Address: McLean Hospital, Waverley, Mass. Associated with him are

Lundholm, Helge. Ph.D. University of Stockholm 1919. Associate Professor of Psychology, Duke University. Formerly Psychologist, McLean Hospital. Address: Duke University, Durham, N. C. And

Fox, Edward L. Chemist at the Nutrition Laboratory of the Carnegie Institution of Washington. Address: 29 Vila Street, Boston. And

Benedict, Francis G. Ph.D. Director, Nutrition Laboratory of the Carnegie Institution of Washington. Address: 29 Vila Street, Boston. Their subject is The Metabolic Rate in "Hypnotic Sleep". Page 777.

Davis, Michael M. A.B., Ph.D. Columbia 1906. Director of Boston Dispensary 1910-20. Executive Secretary Committee on Dispensary Development of the United Hospital Fund of New York 1920-27. Executive Secretary, Associated Out-Patients Clinics of City of New York 1921-1927. Director for Medical Services, Julius Rosenwald Fund, Chicago 1929-. His subject is Physicians' Fees and Hospital Bills. Page 781. Address: Julius Rosenwald Fund, 900 South Homan Avenue, Chicago, Illinois.

Shedden, William M. A.B., M.D. Harvard University Medical School 1920. F.A.C.S. On Staff of Massachusetts General Hospital and Collis P. Huntington Memorial Hospital. Visiting Surgeon at Chelsea Memorial Hospital. His subject is The Management of Permanent Colostomies. Page 792. Address: 270 Commonwealth Avenue, Boston.

Jankelson, I. R. M.D. Tufts College Medical School 1918. Assistant in Medicine, Beth Israel Hospital. Address: 483 Beacon Street, Boston. Associated with him is

Altman, William S. M.D. Tufts College Medical School 1927. Resident Roentgenologist at the Beth Israel Hospital. Address: Beth Israel Hospital, 330 Brookline Avenue, Boston. Their subject is Decholin-Sodium in Cholecystography. Page 796.

Stewart, John D. A.B., M.D. Harvard University Medical School 1928. Surgical Resident, Massachusetts General Hospital. His subject is Acute Salpingitis in Pregnancy. Page 800. Address: Massachusetts General Hospital, Boston.

The Massachusetts Medical Society

A NOTICE WITH RESPECT TO UNPAID DUES

Referring to the notice about unpaid dues, in the *Journal*, March 24, p. 645, the Treasurer, by inadvertence, urged Fellows promptly to send him their unpaid dues. This request should have urged the Fellows of the Society to send such dues to their District Treasurers, in accordance with the By-Laws of our Society. He takes this opportunity, of correction, again to urge prompt payment of all unpaid dues of resident Fellows to the District Treasurers.

Charles S. Butler, *Treasurer.*

DIVIDEND DISTRIBUTION TO THE SEVERAL DISTRICT SOCIETIES

The Treasurer of the Massachusetts Medical Society makes the following report regarding the dividend distribution made April 1, 1932:

The Council of the Society voted to distribute the sum of $5000 to the District Societies this year. The total number of payments received in time to count for the dividend computation was 3277, making the dividend per each paid member $1.5258.

The following table gives the number of payments in each District and the dividend:

District	Number Reported Paid	Check
Barnstable	26	$39.67
Berkshire	86	131.22
Bristol North	51	77.81
Bristol South	159	242.60
Essex North	137	209.03
Essex South	171	260.91

Franklin	31	47.30
Hampden	222	338.72
Hampshire	44	67.13
Middlesex East	80	122.06
Middlesex North	101	154.10
Middlesex South	527	804.09
Norfolk	575	877.33
Norfolk South	92	140.37
Plymouth	98	149.53
Suffolk	500	762.90
Worcester	319	486.73
Worcester North	58	88.50
	3277	$5000.00
Non-resident	190	
Total paid March 1, 1932	3467	
Total paid March 1, 1931	3640	

From March 1 to April 1, 1931, 145 payments were made, making a total of 3785.

From March 1 to April 1, 1932, 141 payments were made, making a total of 3608.

CHARLES S. BUTLER, M.D., *Treasurer.*

ANNUAL MEETING

ARRANGEMENTS are in progress for a very interesting annual meeting of the Society this year on June 8, 9, and 10. It is hoped that every member will enter these dates on his calendar. The Committee of Arrangements will very soon issue detailed information and the Secretary will have the program ready for distribution at an early date.

BOSTON MEDICAL LIBRARY

Fifty-Sixth Annual Report For the Year 1931

Report of the Executive Committee For 1931*

THE regular stated meetings of the Executive Committee have been held each month, and special meetings in April and June.

At the March meeting, the resignation of Dr. Donald Macomber from the Committee on Membership and Elections was accepted, and Dr. Richard B. King appointed to take his place. It was voted to use the gift of $1000.00, received from Dr. W. L. Richardson, toward the cost of constructing the new corridor between the Rotunda and the new rooms of the Massachusetts Medical Society.

At the special meeting in June, the Executive Committee approved an agreement by which the Library accepted the loan of $24,000.00 from the Massachusetts Medical Society, being the Society's share of the sum raised in the joint campaign, upon which the Library is to pay interest until the loan is repaid.

Throughout the year the Library Staff has given loyal and efficient service.

During the year, meetings have been held at the Library by sixteen Medical Societies to the number of forty-six, with a total attendance of 3822.

The total membership of the Library in all classes on December 31, 1931 was 836, of which 616 were Fellows.

HORACE BINNEY, M.D., *Secretary.*

*Read at the Annual Meeting, January 19, 1932.

Report of the Librarian*

THE year 1931 has been one, in spite of many circumstances we might wish had been different, in which the Library has appreciably bettered its position. The builders finished their work and gave us a most excellent depository for the housing of the stacks which are essential to the completion of the plan. We are provided with better heating facilities and better fire protection as we now have standpipes in both the new and old parts of the building, automatic sprinklers in the elevator shaft and boiler room, a water screen on the back of the building where the fire hazard is greatest, and metal window frames and wire glass for the windows opening on the alley.

For many years the necessary work in connection with cataloguing and filing has had to be done in cramped quarters; and the Director's office and the clerical work in connection with it were subject to the same hampering conditions. The generosity of the family of Dr. Oliver Wadsworth, our first secretary, has made a beginning in the remedy of this situation by refinishing the two rooms on the first floor, at one time used as a directory for nurses, and equipping them with modern, metal office furniture. This, when completed, will greatly facilitate the administrative work of the Director, and, at the same time, provide extra space on the second floor for the catalogue department. Removal of books and shelves from the large back room in the basement has made available a much more suitable supper room than the one where the Cotting luncheons of the Massachusetts Medical Society have heretofore been held. This room has been put into shape for this purpose at the least possible outlay and it is hoped that some generously inclined patron of the Library will feel disposed to refinish and appropriately furnish this room, perhaps as a memorial. It has great possibilities, and even as it is, is better than the old room.

The Periodical Room on the third floor of the old building has been made over as a memorial

*Read at the Annual Meeting, January 19, 1932.

to Dr. Morton Prince by Mrs. Prince. Dr. Prince's interest in the Library was such a real one that Mrs. Prince has sought to commemorate it by the refitting of this room, providing a quiet reading place for members only. This has been accomplished most fittingly and tastefully. In the bookcases around the walls is the private library of Dr. Prince, comprising works on neurology and psychiatry principally. Space is left for books of a more general interest and for collections bearing on medical history. Availability of the room for this purpose was made possible by provision for a larger and more accessible place on the second floor opening directly from Holmes Hall into the new building, for the current periodicals. Here again is a splendid opportunity to provide a memorial periodical room, a perpetual reminder of the distinguished services rendered by those who have made New England and Boston medical practice famous.

The capacity of Holmes Hall is frequently taxed to the utmost in the winter season and such an addition for the accommodation of the users of the Library is very essential. If this were available those who desire access to the current periodical literature could go to the files themselves, secure the numbers they need and make use of them in the same room.

Now, an attendant is provided in the larger reading room. It is hard to conceive of a more appropriate memorial than one that should provide facilities for study and research. The five memorial rooms that the generosity of friends of the Library have already provided are splendid examples of the practical value of such philanthropy. If the needs of the institution in this respect were more widely known, it would seem that there might be found those who would be glad of the opportunity to make more effective the facilities for the study of medicine and the allied sciences. Other cities have experienced no difficulty in developing a practical interest in the needs of medical libraries, even in these times of depression. May it not be that if the membership in the Library would make it a point to spread the knowledge of the importance of this institution, not merely to practitioners and medical students, but to the public at large to an almost equal degree, funds could be secured to make our splendid collections of medical books more accessible to the public?

In July, the *Journal of Bone and Joint Surgery,* the official publication of the American and British Orthopedic Associations, began its occupancy of the old Supper Room on the first floor as an editorial office. In September, the Massachusetts Medical Society and the editorial department of the *New England Journal of Medicine,* moved into the accommodations provided for them in the new building. The above-named organizations share in the expense of the upkeep of the building.

These constitute the outstanding changes that have taken place in the physical plant of the Library. They, perhaps, serve only the more strikingly to throw into high relief our needs. The time has not seemed an appropriate one to put forth a further bid for funds to complete our program. Having paid off our mortgage a year ago, it did not seem wise to put another one on the property if any other plan for raising the needed funds could be devised. As soon as it is possible to house in this building the volumes we now have in storage, some income now paid in rental will be available for other purposes.

The Library has lost through the death of Dr. W. N. Bullard, one of its staunchest friends. During his lifetime he had in many ways manifested his interest in the institution, notably in the gift of his collection of sixteenth and seventeenth century books and his personal working library on Epilepsy. In his will his generosity was again shown by the donation of his Incunabula and the sum of $50,000, the income from which is to be used to purchase books preferably along the lines in which he was interested.

The Storer collection of medals has had a valuable addition of David medallions. These were purchased through the History Fund supplemented by a gift from Dr. Storer. The value of this collection has been enhanced by the publication, during the year, of a descriptive catalogue of some eight thousand medals, coins and jetons pertaining to medicine and the allied sciences. For the student of medical numismatics, this catalogue and the collection of medals given by Dr. Storer are invaluable.

Mrs. Henry T. Simons has contributed her annual gift for the purchase of books on Art Anatomy. Mrs. J. S. Harrison of Woodstock, N. Y. presented us with some interesting and historically important correspondence carried on between Dr. James Thacher of Plymouth, Mass., and certain other men of distinction in Revolutionary times. Dr. Thacher was one of the authorities on Revolutionary War history and, as the Library already possesses a considerable amount of material which concerns him and his activities, it seemed fitting that this new material should find a permanent abode here.

Dr. J. W. Farlow, who wrote, in 1918, "The History of the Boston Medical Library" has transferred the copyright to the Library.

The Boston Medical History Club had the usual number of meetings and enjoyed a rather better patronage than in previous years from those interested in the History of Medicine.

On December 31, 1931, the total number of volumes in the Library was 160,000 and there

were also 106,000 pamphlets. During the year, 5,000 volumes and approximately 4,000 pamphlets were added to the various collections of the Library. Included in the books are 445 volumes of Paris theses. There was a recorded circulation and use of 30,000 volumes and an attendance of 10,472 readers. It is impossible to record exactly the number of pamphlets and volumes used because members have access to the open shelves in the reading room. A number of periodical files have been completed and certain new subscriptions have been added to the periodical list. It has been impossible to subscribe for all journals which might be of use to the Library, because of the lack of funds.

Fifteen members of the Library have presented works of which they were the authors and we have received many special donations from members and other interested persons.

Inter-library loans amounted to 1047, for 82 libraries.

CHARLES F. PAINTER, M.D., *Librarian.*

MISCELLANY

REDUCTION IN THE PAYMENTS FOR ANNUAL DUES OF THE MASSACHUSETTS MEDICAL SOCIETY

Probably because of the general economic conditions, there has been an unusual delay in meeting the annual dues of the Massachusetts Medical Society. This may be logically explained by reason of the diminution in the income of physicians during this present economic crisis.

The number who failed to meet the annual payment up to March 1 is in excess of any record of non-payments during the past five years.

A large proportion of these postponed payments will be gradually made up as physicians find it convenient to attend to their financial affairs, but this is a very clear demonstration of the difficulties under which physicians are laboring at the present time, because there is just as much loyalty to the Massachusetts Medical Society as ever in its history and any failure to meet financial obligations may be fairly assumed to be because of the diminished income of practitioners.

We participate in the general hope that the coming year will show a very definite improvement in the revenue of our members.

A REMARKABLE EXPERIENCE

It is reported that Dr. Grace Murray, 84 years of age, one of the first women physicians admitted to practice in New York City, has traveled by airplane from the West Coast to New York City. Although the elderly doctor appeared somewhat tired she was in good general condition and immediately continued her trip to her home in Connecticut. She has the record of having traveled over wide areas, one of her experiences being a flight over the Sierra Mountains at a height of 15,000 feet.

Dr. Murray received her medical degree in 1882 and after serving as an interne at the Women's Medical College in New York City, she began the practice of medicine in 1884. She is now retired.

A VICTIM OF INFECTED MILK

A case of septic sore throat due to the use of milk from an infected cow in Topsfield was reported recently to the State Department of Public Health by Dr. Robert A. Archibald, State Health Officer. This case brings the total of the number in this locality to 19, with one fatality. The latest victim is a clerk in a Topsfield drugstore. The report indicated that he had consumed some of the infected milk which had been purchased by the owner of the store.

THE APPLICATION OF THORIUM TO THE CANCER PROBLEM

According to reports of a discourse by Dr. Joseph Bloodgood in New York recently, thorium has a definite place in the study and treatment of cancer. It appears, according to this report, that the employment of thorium renders the lymph nodes recognizable under x-ray treatment so that it will be possible to determine the extension of a cancer process in some localities where this knowledge may be of use to the operating surgeon. Thorium has been regarded as being radioactive and seems to have a double effect, first, because of its radioactivity and, secondly, in its helpful information with reference to the extension of the disease.

At this same meeting Dr. Francis Carter Wood complimented Dr. Ernest E. Tyzzer of Boston and Dr. Clarence C. Little of Bar Harbor, Maine, for demonstrations of methods by which diagnosis of cancer may be established. Dr. Tyzzer is a former head of the Harvard Cancer Commission, at present devoting his entire time to cancer research work. Dr. Clarence C. Little maintains a cancer research laboratory at Bar Harbor, Maine, in which he works most of the year with a corps of assistants. Dr. Little is a former President of the University of Michigan.

HARVARD SENIORS CONTEMPLATE THE STUDY OF MEDICINE

According to an announcement of the answers received from questionnaires submitted to Harvard seniors of the class of 1932, 19% of the class intend to enter the medical profession.

THE PUBLIC CANCER PROGRAM

During the week beginning April 4 exercises were conducted in many of the centers of Massachusetts. These meetings were designed to convey information to the public with respect to the danger of cancer. Most intensive effort was centered in and about Boston where clinics were held in the Massachusetts General Hospital, the Beth Israel

Hospital, the Boston Dispensary, the Collis P. Huntington Hospital, the Palmer Memorial and Free Hospital for Women in Brookline. During these exercises 200 cases of cured cancer were exhibited.

The Boston program closed with a general meeting on the evening of April 6 in Symphony Hall, under the chairmanship of George H. Bigelow, M.D., State Commissioner of Health. The meeting was addressed at length by Dr. Bigelow who reported on the State program which has been designed to complete the legislative program which included the establishment of a hospital for cancer patients and an educational movement which would bring about more general understanding of the necessity for early diagnosis of cancer. His Honor, Mayor James M. Curley, made an inspiring address in connection with the problem of preventive medicine and paid tribute to the leaders in this cancer program.

Dr. J. S. Estabrook of the American Society for the Control of Cancer described the educational function of this organization which has been the leader in publicity with reference to the education of the public.

Dr. Joseph Colt Bloodgood of Johns Hopkins University delivered an instructive and stimulating address dealing with the necessity for appreciation of the importance of early recognition of any evidence of malignant disease.

It was expected that His Excellency, Governor Joseph B. Ely, would be present, but unfortunately he was detained.

Dr. Ray Lyman Wilbur was also scheduled to speak but, being prevented from attending, he sent a letter which was read by Dr. Bigelow in part in which he stressed the importance of carrying on the educational program to include the problems of child health. The meeting was very largely attended and great interest was manifested in the subject under discussion.

In other sections of the State, meetings were conducted for the purpose of carrying information to the laity respecting the importance of securing general coöperation in the anticancer movement.

ADDITIONS TO THE DEACONESS HOSPITAL FUND

The total contribution to the Deaconess Hospital Fund is now $495,523.96. Less than $4500 is needed to complete the first half million of this fund and it is the hope of the committee that this half million mark will have been reached before Monday, April 11. Of the $495,000 fund, $100,000 is a conditional gift.

OFFICERS OF THE AMERICAN COLLEGE OF PHYSICIANS

A report from San Francisco under date of April 8 shows that Dr. George Morris Piersol of Philadelphia was chosen President-Elect for 1933. Dr. Francis M. Pottenger of Monrovia, California, took office for the presidency for 1932 succeeding Dr. S. Marx White of Minneapolis.

Dr. Piersol is Professor in the Graduate School of Medicine of the University of Pennsylvania and Editor of the *American Journal of Medical Sciences*.

A RADIO MESSAGE PREPARED AND SPONSORED BY THE COMMITTEE ON PUBLIC EDUCATION OF THE MASSACHUSETTS MEDICAL SOCIETY FOR THE DEPARTMENT OF PUBLIC HEALTH

Whooping Cough*

Pertussis, or as it is more commonly called, whooping cough, is a disease not to be considered lightly. Few people realize that 10,000 children die each year in the United States from this disease, that it may be very serious, that it is one of the common causes of death among infants, and that such complications as pneumonia, paralysis, blindness, deafness, and even feeblemindedness may follow in its course. For these reasons it at once becomes obvious that the old saying, "He has to have it some time, you might as well let him have it now", is not only a foolish thing to say but a remark made in ignorance of the true situation. In fact, it is this false idea that makes the control of the disease so difficult and tends to keep the mortality rate high.

The disease is no respecter of age and may occur in the newly-born baby or in well-advanced adult life. When it does occur in these two extremes, the course is severe and the mortality rate very high. However, it is rarely seen in an infant under six months of age and the majority of cases occur between the second and eighth years of life. This is rather fortunate for, if the child is in good health, he can weather the storm better during this period than at any other time. As with so many diseases, season plays an important rôle, whooping cough being much more frequent during the months of March, April, May and June than at any other time. The individual susceptibility to the disease is fully as great as with measles or chicken pox and hence this accounts for its widespread occurrence in crowded tenement districts, and where children are collected in large groups, such as parks and public playgrounds. It is usually transmitted by direct contact although it is possible for a third person to carry the germ on the hands or clothing and infect someone else. The cause of whooping cough is a germ known as the Bordet-Gengou bacillus, which is found in large numbers in the secretions of the nose and throat of the patient. The presence of this germ in the throat and bronchial tubes accounts for the ease with which it is disseminated. Especially is this true when the individual does not cover his mouth when coughing in the presence of those who have

*Broadcast February 25, 1932; Station WBZA, 4:50 P. M.

not had whooping cough. The period of infectiousness, that is, the period during which time the patient may infect others, is usually considered as lasting from two to three weeks after the development of the "whoop". As a result of the variability in this period the duration of the quarantine cannot be stated in a categorical manner but should always be for several weeks. The incubation period, that is, the time elapsing between exposure to the disease and the development of symptoms, also varies but is usually considered as fourteen days.

The symptoms may be divided into three stages, or periods, each lasting about three weeks. During the first period, commonly called the catarrhal stage, the child has the usual symptoms attributed to the "common cold" with nasal discharge, suffused eyes and perhaps a cough. It is at this time that the communicability of the disease is at its height. Yet there is perhaps no other disease more difficult to diagnose in its early stages than whooping cough. There is no one sign or symptom that is always present at this period and if a diagnosis is made it must be by the history and is sometimes aided by the employment of laboratory procedures.

However, as the disease progresses the cough becomes more pronounced (especially at night and at meal times) and finally after about fourteen or eighteen days the characteristic "whoop" is heard.

The "whoop" marks the beginning of the second or parcxysmal stage which is by far the most distressing period both for the patient and for those who care for him. The child, realizing the approach of a paroxysm of coughing, seeks support from its attendant or clings to some article of furniture. There are then three or four violent expiratory efforts, when the breath is forced out, followed by a pause, and then a tremendous effort is made, and the breath drawn in, which entering through a partially closed larynx or upper part of the windpipe, causes the so-called "whoop". During this effort the child's face becomes purple, the veins on the face become prominent, and the eyes congested, all of which makes a very distressing condition to witness. A mass of thick, tenacious, mucous secretion is raised following the "whoop", and if there is any food in the stomach it will be vomited. Following this attack the patient is exhausted, but after a few minutes' rest resumes his play as though nothing had occurred. The attacks may occur from ten to a hundred times a day and may continue over a period of three to five weeks. During this time the patient is unable to retain very much food, and unless he is given careful attention the general nutritional condition will suffer.

The paroxysmal period is then followed by the third stage or period of recession, during which time the coughing gradually becomes less frequent and finally disappears.

Although whooping cough is a disease which runs its own course, yet its severity can be considerably modified, and its complications often prevented by appropriate treatment. Much has been said about vaccines and both good and poor results have been reported by competent physicians with the result that at the present time the exact value of this form of treatment cannot be stated. Various drugs such as sedatives may be used for the control of the paroxysmal attacks of coughing, and if these are wisely used, much of the distress can be avoided, and frequently some of the complications that involve the nervous system. The general care, and especially the feeding and nursing of the child are by far the most important features in the treatment of the disease. During the day the child should be out-of-doors as much as possible provided the weather is suitable; the clothing should be warm but as light and loosely fitting as possible; the patient's room should be cool but all direct currents of cold air should be avoided, as these frequently precipitate attacks of coughing; likewise. before the child is placed in bed, the bed linen should be warm, as cold linen may cause a sudden chilling of the body and a paroxysm of coughing. Equally, if not more important, is the care of the patient's nutritional condition. The vomiting that occurs in whooping cough is not due to nausea or to an intestinal disorder, and therefore there is no reason why the child should not be re-fed as soon as the attack of vomiting has subsided. In fact, this is what should be done, so that when he is over the disease he will not be in a weakened, emaciated condition.

Although the disease may have spent itself, yet it is not uncommon to see the child continue to cough or whoop for several weeks more. When this occurs it may be due either to a habit acquired by the child or to pressure on the bronchial tubes by enlarged lymph glands in the chest. This latter condition can quickly be diagnosed by an x-ray examination, and, should the glands be enlarged, the condition can readily be relieved by x-ray treatment. If the cough is the result of an acquired habit, completely ignoring the child will be effectual.

Until there is a more adequate weapon with which to treat whooping cough than is known today, more can be accomplished by prevention than by drugs. This lies in the recognition by everyone of the serious nature of the disease, particularly in very young children, and the prevention of the spread of the disease by fairly rigid isolation of patients suffering from it. Especially should the contact of the patients with infants, very young children, and elderly individuals be avoided.

HOSPITAL REMEMBERED IN THE WILL OF DR. WILLIAM APPLETON

Dr. William Appleton, formerly of the Back Bay, who had retired from the practice of medicine years ago, died on March 21. He left $2,000 to the Boston Home for Incurables in Dorchester and an equal amount to the Children's Hospital.

COMPARISON OF DISEASE INCIDENCE IN CONNECTICUT WITH 1931 AND SEVEN YEAR AVERAGE

MONTH ENDING APRIL 2, 1932

Diseases	1932 Week ending March 12	1932 Week ending March 19	1932 Week ending March 26	1932 Week ending April 2	Average cases reported for week corresponding to April 2 for past seven years	1931 Week ending March 14	1931 Week ending March 21	1931 Week ending March 28	1931 Week ending April 4
Cerebrospinal Men.	—	—	1	1	2	2	2	1	—
Chicken Pox	114	94	44	64	78	107	88	90	63
Conjunctivitis Inf.	1	1	—	—	2	2	—	2	—
Diphtheria	1	8	7	3	21	15	6	6	5
Dysentery Bacillary	3	—	—	—	—	—	—	—	—
Encephalitis Epid.	2	—	—	1	—	—	—	1	—
German Measles	9	5	4	2	49	6	2	5	4
Influenza	28	70	38	58	31	24	17	36	9
Measles	236	200	154	181	361	766	794	870	542
Mumps	53	61	89	40	91	66	68	88	69
Pneumonia (Broncho)	40	50	43	40	50	63	56	50	35
Pneumonia (Lobar)	60	76	63	70	68	52	48	65	56
Scarlet Fever	109	125	91	99	95	59	54	85	59
Septic Sore Throat	5	4	5	8	2	—	2	1	4
Smallpox	4	—	2	1	—	—	—	—	—
Tetanus	—	1	1	—	—	—	—	—	—
Tuberculosis (Pul.)	20	30	12	35	31	43	26	24	29
Tuberculosis (O. F.)	—	6	2	7	3	2	3	4	1
Typhoid Fever	1	—	—	—	—	1	—	—	—
Undulant Fever*	—	1	2	—	—	—	—	—	1
Whooping Cough	129	128	99	96	70	95	81	101	80
Gonorrhea	14	13	29	26	30	28	41	21	12
Syphilis	37	50	38	53	32	27	46	48	54

*Made reportable August 14, 1928.

Remarks: No cases of Asiatic cholera, glanders, plague, or yellow fever during the past seven years.

THE MENACE OF RADIUM "CURES"

Federal and medical authorities in different parts of the country have been interested in the claims that the death of one Eben M. Byers, wealthy Pittsburgh steel manufacturer, has been due to drinking water containing radium in solution. This matter has been discussed more or less intensively by several individuals and different interpretations, beliefs or attitudes seem to be shown.

Dr. Herman T. Peck, Acting Commissioner of the City Health Department of New York, has announced that five inspectors of the Bureau of Food and Drugs have been assigned to study the possible distribution of alleged radioactive cures which may have been sold in violation of the sanitary code.

Dr. Frederick B. Flinn, Director of Industrial Hygiene at the College of Physicians and Surgeons, Columbia University, has stated his belief that many more people are suffering from radium poisoning, as a result of drinking radium water solution. One other death has been ascribed to this cause and he believes that more are doomed to perish. There seems to be a growing conviction among authorities that strong opposition should be expressed to the employment of any of the advertised radium "cures".

Dr. Peck has also announced that inspectors of the Bureau of Food and Drugs thus far have failed to find any radioactive waters on sale in New York City, but that they are continuing their investigations and a further report will be made later.

MORTALITY RATES

Telegraphic returns from 85 cities with a total population of thirty-seven million for the week ending March 26, indicate a mortality rate of 13.5 and the same rate appears for the corresponding week of last year. The highest rate (21.9) appears for Cincinnati, Ohio, and the lowest (4.2) for South

Bend, Ind. The highest infant mortality rate (22.8) appears for Knoxville, Tenn., and the lowest for Bridgeport, Conn., Cambridge, Mass., Evansville, Ind., Long Beach, Calif., Tacoma, Wash., and Tampa, Fla., which reported no infant mortality.

The annual rate for 85 cities is 12.6 for the twelve weeks of 1932, as against a rate of 14.1 for the corresponding period of the previous year.

DANGERS TO THE BABIES

It is quite generally recognized at the present time that city babies have a better chance of escaping disease and of growing up than those born in the country. This has been shown in a statistical comparison of the city babies and those of the contiguous counties by the State Department of Health for Baltimore. Further study shows that the same demonstration can be made in other parts of the country. The prevalence of diarrheal diseases, for instance, is less in the city than in the country and other elements entering into the development of disease, such as flies, unclean fingers and food, the three main sources of danger to the babies, are less likely to be a problem in the urban centers, it is believed.

UNCLEAN HANDS AS CONVEYORS OF DISEASE

Dr. Theodore B. Appel, Secretary of Health of the Commonwealth of Pennsylvania, brings forward the thought that people who do not use sufficient soap and water in cleansing their hands are unquestionably the cause for the dissemination of certain diseases. This is true especially in such conditions as respiratory and bronchial affections in which people contaminate their hands when using their handkerchiefs. If is also true in the case of food handlers who may, when coughing, spray the food to be dispensed, contributing to the possible extension of diseases of this type. Further, there is a likelihood that germs may be disseminated by means of unclean objects such as doorknobs, common towels, etc. Briefly, more attention should be paid to the problem of cleanliness through frequent washing of the hands whenever there is any probability of the distribution of disease germs.

DENTAL DECAY AND CORRECTIONS AMONG SCHOOL CHILDREN OF DIFFERENT AGES

The teeth of a great many school children have been examined by medical officers of the United States Public Health Service in connection with general physical examinations.

In connection with these studies, 12,435 oral examinations were made by dental officers in Georgia, Illinois, Missouri and Maryland. The summary of these examinations is as follows:

The studies of the temporary teeth indicate that the highest percentages of children having decayed temporary teeth occur in the 7- and 8-year groups, while the highest incidence of "remaining roots" is among 8-year-old children. Six-year-old children have the highest percentage of temporary teeth with fistulae. The number of children with filled temporary teeth is so small as to be negligible.

The percentages of children having permanent teeth decayed, missing, or filled increase rapidly up to the eighth year and more slowly among older children. The incidence of unfilled cavities of permanent teeth increases with age. There were more children at 14 and 15 years than at other ages who had permanent teeth nearly destroyed by decay. The percentages of children who had permanent teeth filled as well as those who had permanent teeth extracted increase with age.

When both temporary and permanent teeth are considered together, about 90 per cent of the children in each age group had one tooth or more decayed, missing, or filled. A much greater proportion of younger than of older children had unfilled, decayed teeth. An even greater preponderance of younger children had at least one tooth nearly destroyed by decay. The number of children with filled teeth is much higher in the older than in the younger age groups. The percentages of children having teeth with fistulae are relatively high among children under 10 years of age.

A PROBLEM CONNECTED WITH CANCER CURES

A radio talk was recently delivered by Lord Moynihan, one of the world's leading cancer specialists, and president of the Royal College of Surgeons, England, against quackery in the sale and promotion of alleged cancer "cures," which has application in this country as well as in Great Britain. According to the report in the *United States Daily*, Lord Moynihan said, "The cancer cure is still a curse in every land, and the most pathetic credulity as to his claim is shown by people who should know better."

When taken in the early stages, cancer may be cured by surgical treatment. The Food and Drug Administration is convinced that the sale of so-called cancer "cures" results not only in economic loss to the buyer but in addition may give the purchaser a false sense of security at a time when immediate action must be taken if the disease is to be cured. In 24 years' regulatory operation of the Federal Food and Drug Act, the Administration has instituted more than 70 court actions against more than 40 so-called cancer "cures" in this country and where such fakes enter interstate commerce the Government takes immediate legal action under the law.

THE BRITISH BIRTH RATE

A special dispatch from London to the *New York Times* reports that the birth rate for the last quarter of 1931 and the whole year was the lowest ever recorded. There is the suggestion that before very long the population of England and Wales will become stationary at or around 40,000,000. The average for the year just past was 15.8 births per thou-

sand population and for the fourth quarter a little less. In the last decade the annual rate has fallen from 20.4 to 15.8 per thousand. Since the death rate for this period has remained more or less constant at about 12 per thousand there is every indication that as above stated the population will become approximately stationary unless a change in the birth rate takes place.

RECENT DEATH

BOLAND—Dr. Elisha S. Boland, aged 79, a former practitioner of South Boston, died April 7 at his home in Peabody Square, Ashmont, following an illness of two years.

He was born in 1852 at Port Hope, Ontario, Canada, and was educated at the University of Ohio in Cincinnati from which he received his M.D. degree in 1877. Soon after his graduation he came to Boston as Assistant Superintendent of the old Boston Insane Hospital, then located in South Boston. Later he engaged in private practice in South Boston which he continued for 45 years.

He was a member of the Massachusetts Medical Society having joined in 1878 and retired in 1927. During his active life he was a member of the South Boston Medical Society and several social organizations. He served as trustee of the South Boston Savings Bank for several years. In 1886 he married Esther Frances Nichols of South Boston who survives him as do three sons, George Ward Boland of Ashmont, Eric M. Boland of Melrose, and Kells S. Boland of Belmont; also two nephews, Dr. Frank K. Boland of Atlanta, Ga., and John S. Morrison of Lafayette, Ind.

NOTICES

REMOVALS

James Hitchcock, M.D., announces the removal of his office to 282 Berkeley Street, Boston.

Joseph Resnik, M.D., announces the removal of his office to 184 Bay State Road, Boston.

RADIO HEALTH MESSAGES

April-May-June, 1932

Sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

Courtesy WBZ. Tuesdays, 4:20 P.M.

April

19 Appendicitis
26 How Are Your Arteries?

May

3 Physical Culture in School Children
10 The Dangers of Being Fat
17 The Deaf Child
24 Medical Care
31 Growth and Development

June

7 Prenatal and Maternity Service
14 New Findings in Oral Hygiene
21 Community Public Health
28 Communicable Diseases

State House Broadcast

Sponsored by the Massachusetts Department of Public Health.

Courtesy WEEI. Fridays, 12:30 P.M.

Health matters of public interest discussed by the Division Directors of the Department.

Radio Health Forum

Queries from the public are answered under the sponsorship of the Department of Public Health.

Courtesy WEEI. Fridays, 4:50 P.M.

Questions on Health and Prevention of Disease may be sent to Radio Health Forum, State Department of Public Health, State House, Boston.

TRAVEL TOURS FOR 1932

Literature, designed to secure bookings for the Coöperative Clinic Tours in connection with the Hundredth Anniversary Meeting of the British Medical Association, has been disseminated by the Amerop Travel Service. The *Journal* will be pleased to furnish further information to anyone who contemplates a trip abroad this summer.

REPORT AND NOTICES OF MEETINGS

THE STAFF CLINICAL MEETING OF THE SURGICAL DEPARTMENT OF THE BOSTON CITY HOSPITAL

The staff clinical meeting of the Surgical Department of the Boston City Hospital was held in the Cheever Amphitheatre on March 24. The program was presented by Dr. Horace Binney's service.

Dr. S. J. Maddock presented a case of compound fracture of both bones of the lower leg which has been treated by the application of maggots. The leg was first put in a Thomas splint. After six weeks, because of malposition, a bone band was placed over the tibia. It was kept on six weeks. At that time there were two draining sinuses, and the x-ray showed osteomyelitis. Maggots were applied since operation was evidently contraindicated. In the past two months the maggots have removed several fragments of sequestrum, and the ulcerating area has become smaller.

Dr. James J. Hepburn spoke on "Cholelithiasis." He briefly sketched the history of the disease and mentioned some of the impressions he has gained from its study. Although the number of deaths, according to life insurance statistics, from this disease is not increasing, he believes that clinically it is becoming much more common.

About 85% of the cases can be diagnosed clinical-

ly. The Graham test is 95% accurate in cases which show filling of the gall bladder, 80% if there is no filling. In case of doubt, clinical experience should be trusted rather than the cholecystogram.

Gall bladder disease seems to be the result either of infections beginning in youth or of faulty fat metabolism. Often the clinical course of infection can be followed; food dyspepsias, biliary colic, and complications such as gangrene occur in progressively later age groups.

Among the complications of cholelithiasis should be listed, according to Dr. Hepburn, carcinoma of the gall bladder, arthritis, hepatitis, and degenerative cardiac disease.

The mortality of operation should be no higher than for general surgery. The conservative treatment should be employed in empyema of the gall bladder. He believes that acute salpingitis and cholecystitis are comparable and should be treated in the same way.

Dr. George W. Papen discussed "Duodenal Fistulae." They may result from perforated gastric ulcers, from imperfect closure of the duodenum after gastric resection, from accident during removal of the right kidney, from gall bladder surgery or from trauma.

If the fistula is directly opposite the ampulla, the patient can starve to death in 48 hours. There is an exceedingly rapid loss of chlorides, even more marked than in high intestinal obstruction. Fifty-seven per cent of the cases have resulted in death. Diagnosis is established by giving methylene blue by mouth and noting its prompt appearance from the fistula.

Treatment may be surgical or medical. Direct surgical attack is extremely difficult except following nephrectomy. In this case the fistula is dissected out and an omentopexy done. Occlusion of the pylorus with the establishment of a gastroenterostomy has been advocated but seems to be of no value. The best surgical method is to do a jejunostomy and return the output of the fistula to the jejunum.

Medical treatment is often more satisfactory. The amount of discharge should be diminished by restricting the fluid intake to one liter daily. Hygroscopic foods should be given. The activity of the pancreatic enzymes should be reduced by placing peptones in the wound, or by packing it with gauze soaked in beef serum. The gastric hydrochloric acid should be neutralized by calcium carbonate. The contact time of the enzymes with the skin should be diminished by the use of the constant suction pump or continual irrigation. Sometimes the abdominal skin can be cleaned and a heavy layer of collodion applied.

A case of traumatic rupture of the duodenum was shown. This patient developed a duodenal fistula three days after operation. He was treated medically. The fistula closed within three weeks. He now has some duodenal obstruction, but it does not appear to be progressive.

Dr. Papen also presented a patient who, fourteen months after a two-stage prostatectomy, developed difficulty of urination. At operation a secondary vesical calculus about the size of a walnut was found. There was also a vesical flap covering the urethral orifice; this was undoubtedly the cause of the obstruction. Such secondary calculi, according to Dr. Augustus Riley, are not infrequent following prostatectomy.

Dr. Horace Binney demonstrated a specimen of a cancer of the gall bladder. The patient, a woman of 79, had a large cystic tumor with no definite history of gall stones. She had such intense right upper quadrant pain that she was operated on under local anesthesia. The tumor was found to be a much enlarged gall bladder containing papillary masses. She lived two days after exploration. The tumor tissue proved to be papillary adenocarcinoma. The case was presented on account of its comparative rarity, and the lack of any association with gall stones.

Dr. Binney then discussed "Pulmonary Embolectomy." This operation was first done by Trendelenburg in 1914. He attempted it on 12 patients all of whom died. The first successful case was reported in 1924; since then, of 16 reported cases, 7 were definitely successful.

The frequency of this condition ranges from 0.5 to 2% of all abdominal operations, according to different statistics. Dr. Binney pointed out that while many of the cases will live only a few minutes after the embolus has been caught in the pulmonary artery, some live from two to nine hours, allowing ample time for embolectomy.

The hospital has just acquired a set of instruments for the operation. Dr. Binney outlined their application and the technique of embolectomy.

Dr. Newton C. Browder discussed "Points in Connection with Treatment of Colles's Fracture." He believes that many poor results can be ascribed to incomplete breaking up of the impacted fracture. The method of reduction is not so important as the attainment of pronation and ulnar adduction of the hand.

He believes the posterior splint should be removed after three days, massage begun after ten days, and all splints removed at the end of three weeks. Splints are often made too wide to allow ample motion. The Cotton-Loder position should be used only if position cannot be maintained otherwise. Usually this is the result of improper breaking up of the impaction. This position should not be maintained more than ten days.

Dr. Lewis R. Dretler presented a case of traumatic tension pneumothorax. A boy, five years of age, entered the emergency ward in shock, following trauma. His chief complaint was abdominal pain, his pulse was 160, white count 60,000, and abdomen board-like. Following treatment for shock he became moribund. An x-ray was taken which showed a large pneumothorax. Air was withdrawn by tapping in 250-cc. amounts for three days: then a

catheter was introduced. He developed empyema in three weeks, but since has completely recovered.

AMERICAN CLIMATOLOGICAL AND CLINICAL ASSOCIATION

The Forty-ninth Annual Meeting of the American Climatological and Clinical Association will be held at Seaview Golf Club, Absecon, N. J., Atlantic City, May 5, 6, and 7, 1932.

PRELIMINARY PROGRAM

FIRST DAY, MAY 5

Scientific Session, 10:00 A.M. to 12:30 P.M.

Business Session, 12:30 P.M.

Luncheon.

Afternoon Round Table for those not wishing to enjoy golf or tennis.

SECOND DAY, MAY 6

Scientific Session, 9:30 A.M. (promptly).

Business Session — Election of Officers and New Members, 12 M.

Luncheon Recess.

Round Table. Golf, tennis. Swimming pool.

8:00 P.M. Annual Dinner at Seaview Golf Club.

THIRD DAY, MAY 7

Scientific Session, 9:30 A.M. (promptly).

Business Session, 12:30 P.M.

Luncheon Recess.

Scientific Session if necessary. Adjournment.

PROGRAM OF SCIENTIFIC SESSIONS

The Seaview Golf Club, Absecon, N. J.

THURSDAY, MAY 5, 1932, 10:00 A.M.

1. President's Address. Louis Hamman, M.D.

MEMORIAL NOTICES

J. Madison Taylor, M.D., by Guy Hinsdale, M.D.

H. Longstreet Taylor, M.D., by J. Gurney Taylor, M.D.

Herbert F. Williams, M.D., by Raymond Clark, M.D.

Professor R. DeCourcy Ward, M.D., by Guy Hinsdale, M.D.

SCIENTIFIC SESSION

2. Iron Content of the Blood in a Variety of Conditions. Chauncey W. Dowden, M.D., Louisville.
   Discussion opened by Sydney R. Miller, M.D., Baltimore.
3. Early ("subclinical") Syphilitic Aortitis. An Evaluation of Early Radiographic Diagnostic Methods. Hugh J. Morgan, M.D., Nashville.
   Discussion opened by Albert Keidel, M.D., Baltimore.
4. Blood Sedimentation as a Prognostic Aid. L. W. Bortree, M.D., Colorado Springs.
   Discussion opened by Fred H. Heise, M.D., Saranac Lake.
5. The Importance of the Treatment of Pernicious Anemia on a Quantitative Basis. George R. Minot, M.D., Boston.
   Discussion opened by Walter A. Baetjer, M.D., Baltimore.
6. Osteomalacia, with Report of a Case. Roy Ross Snowden, M.D., Pittsburgh.
   Discussion opened by Wm. S. McCann, M.D., Rochester.
7. Relationship Between Emotional Tension and Organic Disease. Maurice Fremont-Smith, M.D., Boston.
   Discussion opened by James E. Paullin, M.D., Atlanta.
8. An Outbreak of Hemolytic Streptococcus Infection in a Boys' School. Samuel T. Nicholson, Jr., M.D., Pottstown, Pa.
   Discussion opened by Frank A. Evans, M.D., Pittsburgh.

THURSDAY AFTERNOON, MAY 5

ROUND-TABLE CONFERENCE ON DISEASES OF THE HEART

Joseph S. Pratt, M.D., Chairman

Topic for discussion: *Psychogenic Cardiac Manifestations.* The discussion will be participated in by:

Walter A. Baetjer, M.D.
Maurice Fremont-Smith, M.D.
**T. Stuart Hart*, M.D.
Henry Jackson, Jr., M.D.
Charles H. Lawrence, M.D.
**Howard B. Sprague*, M.D.
William D. Stroud, M.D.
Joseph T. Wearn, M.D.
Charles C. Wolferth, M.D.

*Names in italics are guests of the Association.

FRIDAY, MAY 6

9:30 A.M.

9. Tonsillitis, a Medical Disease. William Henry Robey, M.D., Boston.
   Discussion opened by Thos. A. Claytor, M.D., Washington.
10. Pathology of Cardiac Infarction. L. Whittington Gorham, M.D., Albany.
    Discussion opened by Joseph T. Wearn, M.D., Cleveland.
11. Encapsulated Hydrothorax. Charles R. Austrian, M.D., Baltimore.
    Discussion opened by Roy D. Adams, M.D., Washington.
12. Situs Inversus: A Report of Six Cases, Four Representing Pulmonary Disease. John J. Lloyd, M.D., Rochester.
    Discussion opened by John T. King, Jr., M.D., Baltimore.

13. The Clinical and Functional Termination in Surgical Tuberculosis Ten Years After. Alfred H. Garvin, M.D., Buffalo.
Discussion opened by *Robert T. Miller*, M.D. Baltimore.

14. Accessory Lobes of the Lungs. William B. Soper, M.D., New Haven.
Discussion opened by Kennon Dunham, M.D., Cincinnati.

15. Some Little Appreciated Aspects of Hodgkin's Disease. Henry Jackson, Jr., M.D., Boston.
Discussion opened by O. H. Perry Pepper, M.D., Philadelphia.

16. The Uses and Dangers of Lipiodol in Visualization of the Lower Respiratory Tract. James B. Amberson, Jr., M.D., *H. McLeod Riggins*, M.D., New York.
Discussion opened by James Alexander Miller, M.D., New York.

FRIDAY AFTERNOON, MAY 6

ROUND-TABLE CONFERENCE ON DISEASES OF THE LUNGS

Lawrason Brown, M.D., Chairman

A Discussion of Artificial Pneumothorax

Is artificial pneumothorax justified in the minimal stage?

What is the relation of age to artificial pneumothorax?

Is it advisable to add a certain quantity of carbonic acid gas to the air before injections in order to decrease the frequency of refills?

The cause and preventions of effusions.

The treatment of serous effusions.

Mediastinal Hernia, Its Danger and Treatment.

The Treatment of Complicating Pyopneumothorax, with and without Pleural Bronchial Fistula.

The Use of Bilateral Pneumothorax.

Oleothorax: When to Be Used. What Are the Dangers?

What are the Practical Results of Artificial Pneumothorax?

SATURDAY, MAY 7

9:30 A.M.

17. Can an Early Diagnosis of Primary Carcinoma of the Lung Be Made with Reasonable Certainty? Elmer H. Funk, M.D., *L. H. Clerf*, M.D., Philadelphia.
Discussion opened by Gordon Wilson, M.D., Baltimore.

18. Acropachy (osteo-arthropathy of doubtful etiology). Henry M. Thomas, Jr., M.D., Baltimore.
Discussion opened by Edwin A. Locke, M.D., Boston.

19. The Influence of Solar Radiation on the Distribution and Prevalence of Exophthalmic Goiter. James H. Smith, M.D., Richmond.
Discussion opened by Stewart R. Roberts, M.D., Atlanta.

20. The Unroofing of Pulmonary Tuberculous Cavities. Col. E. H. Bruns, M.D., Denver.
Discussion opened by *Robert T. Miller*, M.D., Baltimore.

21. When to Discontinue Artificial Pneumothorax Treatment. Woods Price, M.D., Saranac Lake.
Discussion opened by David R. Lyman, M.D., Wallingford, Conn.

22. Non-Fatal Stab Wounds of the Ventricles, with Electrocardiographic Signs of Coronary Thrombosis and Absence of Anginal Pain. William B. Porter, M.D., Richmond.
Discussion opened by Charles C. Wolferth, Philadelphia.

23. Clinical Observations on Adhesive Pericarditis. Paul D. White, M.D., *Howard B. Sprague*, M.D., and *Hobart A. Burch*, M.D., Boston.
Discussion opened by William D. Stroud, M.D., Philadelphia.

NOTES

A program like this should draw a large attendance even in these hard times.

Guests will be welcome.

The management of the Club announces a 10% reduction on rooms and meals over former standard prices.

Those wishing to propose medical men for membership will please do so, if possible before the meeting. Names should be sent either to Gordon Wilson, M.D., 715 Park Avenue, Baltimore, or to the secretary.

Reservations should be procured through Mr. David Brandt, Seaview Golf Club, Absecon, New Jersey.

The Council will meet Wednesday evening, May 4.

For final program and detailed information apply to Dr. Arthur K. Stone, Secretary, Framingham Centre, Mass.

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

The Annual Meeting will be held April 28, 1932, at the Continental Hotel, Cambridge.

Business Meeting, Election of officers at 11:30 A.M.

Dinner, Tickets not necessary, 12:00 M.

Speaker: Dr. Paul Gustafson.

Title: Medical Articles in the Lay Press.

A. A. LEVI, M.D., *Secretary.*

BOSTON MEDICAL HISTORY CLUB

ANNUAL MEETING

Boston Medical Library, 8 The Fenway, Boston, Monday, April 18, 1932, at 8:15 P.M.

Balzac's Account of Ambroise Paré and the Last Illness of Francis the Second. William P. Coues, M.D.

Venerable Bede and Phlebotomy. Fred B. Lund, M.D.

Two controversies. The invention of the telegraph and the discovery of anesthesia. Illustrated by stereopticon. Albert H. Miller, M.D., Providence.

Light refreshments.

JAMES F. BALLARD, *Secretary.*

THE MASSACHUSETTS SOCIETY FOR SOCIAL HYGIENE

The annual meeting of the Massachusetts Society for Social Hygiene will be held at luncheon on Monday, April 25, in the Georgian Room of the Hotel Statler at one o'clock.

Program: The Accomplishments of the Past Year, Dr. Wilson G. Smillie, President; The Social Hygiene Problem—Today and Tomorrow, Dr. C.-E. A. Winslow, Yale University School of Medicine. Dr. George H. Bigelow, Commissioner of Public Health, will also address the meeting.

The new pamphlet of the Society, "Growing Up in the World Today," will be distributed, and the new exhibit of the Society will be displayed for the first time.

Luncheon tickets are $1.50.

AMERICAN HEART ASSOCIATION, INC.

The Scientific Session of the American Heart Association will be held on Tuesday, May 10, 1932, from 9:30 A.M. to 5:30 P.M. in the New Orleans Municipal Auditorium, Rampart and St. Peter Streets, New Orleans, Louisiana.

I. C. RIGGIN, M.D., *Executive Secretary.*

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance), Tuesday evening, April 26, at 8:15 o'clock. Program:

Presentation of Cases.

Neural Basis of Emotional Reactions, by Dr. Philip Bard, Assistant Professor of Physiology, Harvard Medical School.

JOHN HOMANS, M.D., *Secretary.*

NEW ENGLAND PHYSICAL THERAPY SOCIETY

The next meeting of the New England Physical Therapy Society will be held at the Boston Square and Compass Club, 448 Beacon Street, Boston, on the evening of Wednesday, April 20, at 8:00 o'clock.

The paper of the evening will be "Electrosurgery, Its Use in General Surgery and Cancer" (Illustrated), by Dr. Benjamin F. Boland of Boston. Dr. Boland's paper will be discussed by Dr. Francis P. McCarthy of Boston, and Dr. Byron S. Price of New York City. All members of the medical profession are cordially invited to attend.

Preceding the regular meeting, the Council will meet at 6:00 o'clock and dinner will be served at 6:30.

ARTHUR H. RING, M.D., *Secretary.*

NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

The regular clinical conference of the New England Hospital for Women and Children will be held at the hospital, Dimock Street, Roxbury, at 8 P.M. on Thursday, April 21. The following cases will be presented and discussed:

Medical: Dermatitis Medicamentosa; Tubercular Peritonitis; Myocardial Degeneration.

Surgical: Chronic Hepatitis with Chronic Cholecystitis and Cholelithiasis; Chronic Ileitis with Intestinal Obstruction.

ALICE H. BIGELOW, M.D., *Secretary.*

SOCIETY MEETINGS
CONGRESSES AND CONFERENCES

April, Autumn—International Postgraduate Courses in Berlin. See page 1169, issue of December 10.

April 12—Harvard Medical Society. See page 768, issue of April 7.

April 12—Joint meeting of the Greater Boston Medical Society and the Trudeau Society. See page 768, issue of April 7.

April 12—Scuth End Medical Club. See page 715, issue of March 31.

April 13—New England Dermatological Society. See page 768, issue of April 7.

April 13—Beth Israel Hospital House Officers' Alumni Association. See page 767, issue of April 7.

April 14—Medical Clinic at the Peter Bent Brigham Hospital. See page 763, issue of April 7.

April 14—Massachusetts General Hospital (Clinical Staff Meeting). See page 768, issue of April 7.

April 15—William Harvey Society. See page 715, issue of March 31.

April 15 and 22—Thomas W. Salmon Memorial Lectures. See page 650, issue of March 24, and page 763, issue of April 7.

April 15—The New England Roentgen Ray Society. See page 768, issue of April 7.

April 18—Boston Medical History Club. See page 823.

April 20—New England Physical Therapy Society. See notice elsewhere on this page.

April 21—New England Hospital for Women and Children. See notice above.

April 25—The Massachusetts Society for Social Hygiene. See notice elsewhere on this page.

April 26—Harvard Medical Society. See notice elsewhere on this page.

April 28—The Annual Meeting of the Massachusetts Tuberculosis League. See page 768, issue of April 7.

April 29—Massachusetts Psychiatric Society. See page 715, issue of March 31.

May 3—Lecture by Dr. E. V. McCollum (Massachusetts Dental Society). See page 763, issue of April 7.

May 5, 6 and 7—American Climatological and Clinical Association. See page 822.

May 6 and 7—The American Proctologic Society. See page 767, issue of April 7.

May 9-13—American Medical Association, New Orleans, La.

May 10—American Heart Association. See notice elsewhere on this page.

May 11 - June 1—New England Heart Association. See page 891, issue of October 29.

June 6, 7, 8, and 9—National Tuberculosis Association. See page 598, issue of March 17.

June 8, 9, 10—Massachusetts Medical Society, Hotel Statler, Boston.

June 21-24—Catholic Hospital Association. See page 369, issue of February 18.

July 10 - August 12—The Second Intensive European Summer Course in Surgery, Gynecology and Obstetrics. See page 714, issue of March 31.

September 19-22 — International Congress of Biliary Lithiasis. See notice on page 427, issue of February 25.

October 24-27 — American Public Health Association. See notice on page 1321, issue of December 31.

October 24-28—Inter-state Postgraduate Medical Association of North America. See page 39, issue of January 7.

DISTRICT MEDICAL SOCIETIES

Essex North District Medical Society

May 11—The next meeting of the Essex North District Medical Society will be held Wednesday, May 11, at Andover Academy, dinner at Phillips Inn, talking movies.

E. S. BAGNALL, Secretary.

Essex South District Medical Society

May 5, Thursday—Censors' Meeting, Salem Hospital, 3:30 P.M.

May 10, Tuesday—Annual Meeting. The Tavern, Gloucester. Speaker and subject to be announced later. Ladies invited.

Franklin District Medical Society

May 10—Meeting at the Weldon, Greenfield, at 11 A.M.

CHARLES MOLINE, Secretary.

Middlesex East District Medical Society

May 11 (Unless otherwise announced)—At Woburn.

Middlesex South District Medical Society

April 28—See page 823.

Norfolk District Medical Society

May—Annual Meeting, date and place to be announced.

May 5—Censors' Meeting for examination of candidates. Roxbury Masonic Temple, 171 Warren Street, Roxbury, 4 P.M. Fee $10.00 payable at time of examination. All candidates will have applications in the hands of the secretary one week prior to this date. All candidates from Medical Schools not on approved list of Society must have application complete two weeks prior to date of examination.

F. S. CRUICKSHANK, Secretary.

Norfolk South District Medical Society

May 5—Annual Meeting at 12 o'clock noon, at the Norfolk County Hospital, South Braintree. Censors will meet on May 5 at 11:15 A.M. at the Norfolk County Hospital.

N. R. PILLSBURY, Secretary.

Suffolk District Medical Society

April 27—The Annual Meeting, Boston Medical Library. Election of Officers.

The Medical Profession is cordially invited to attend this meeting.

REGINALD FITZ, M.D., Vice President.
LELAND S. McKITTRICK, M.D., Secretary.

Worcester District Medical Society

Wednesday afternoon and evening, May 11—Annual Meeting. Program to be announced later.

ERWIN C. MILLER, Secretary.

BOOK REVIEWS

A Thousand Marriages. A Medical Study of Sex Adjustment. By ROBERT LATOU DICKINSON and LURA BEAM. Foreword by Havelock Ellis. The Williams and Wilkins Company. Baltimore. 1931. Pp. XXV—482. Price $5.00.

A Thousand Marriages—A Medical Study of Sex Adjustment—is a statistical study from the records of one obstetrician and gynecologist. These particular cases have been chosen for analysis because of the fact that the sex data were more complete. From a statistical point of view this study cannot in any sense be taken as representative of normal marriage. It supplements the work of two other American investigators; Dr. Katharine B. Davis—Factors in the Sex Life of Twenty-two Hundred Women—and Dr. G. V. Hamilton — A Research in Marriage. To quote from the introduction, "This new Dickinson-Beam series presents no average picture. It is overloaded on the side of trouble by the number who came for advice for marital predicaments." It is made admittedly from the practice of one man in one section of the country, and in general therefore chiefly from the urban middle classes. Furthermore, the patients were all women and though an occasional bit of evidence is quoted from a husband, the evidence is preponderantly of female origin.

The general tone of the study gives the impression of being too emotional. The major portion has obviously been written by one for the most part without medical background. There has been too great emphasis on eroticism. From the point of view of constructive thought the book is a distinct disappointment, and yet again, to quote from the introduction, "it should leave the reader with the feeling that a large part of the difficulties are preventable".

Having said all this in criticism it must be admitted that the book is an extraordinary record. It gives a glimpse into the emotional life of women such as only a physician could get. As a true picture of marriage it is a disappointment; but as an indication of what is going on under the surface in the types of women who throng doctors' offices it is of great value. It should furnish valuable data to the doctor, the psychologist or the sociologist.

Surgical Clinics of North America. **December, 1931. Philadelphia Number. Volume 11, Number 6. Philadelphia, W. B. Saunders Company.**

This issue opens with the very interesting clinic of Chevalier Jackson and W. Wayne Babcock. They describe their one-stage laryngectomy for carcinoma of the larynx. Under procaine anesthesia a high collar incision is made and the larynx removed from above downward. The tracheostomy includes a portion of the cricoid cartilage to prevent collapse. While the pharynx is open, the wound is protected by pads wet with 1:200 hydrochloric acid, and as soon as the pharynx is closed the wound is dusted with bismuth in order to minimize infection. Fine silver wire is used for sutures and ligatures.

Two cases of ganglioneuroma are reported, one in the chest and one retroperitoneal. These rare tumors arise from the sympathetic ganglia and are usually benign.

They emphasize the importance of conservative treatment of an anthrax pustule.

Carnett calls attention to the possibility of a strangulated hernia being caused by some important condition that might be overlooked. He cites cases of a perforated peptic ulcer, a Littre inguinal hernia with an umbilical hernia, acute appendicitis, and primary peritonitis, all of which were associated with strangulated herniae.

Carnett, Bates and Linney present cases of splenectomy for Hodgkin's sarcoma and for a large epidermal cyst. They discuss the rôle of the spleen in relation to calcium metabolism and the blood platelets.

From the clinic of John B. Deaver there are reports of carcinoma in an ovarian dermoid cyst, of

an intraäbdominal abscess with a fecal fistula, and of intestinal obstruction following a herniorrhaphy.

In their excellent discussion of diabetic gangrene Eliason and Wright warn against the use of hot wet dressings and ointments. In general they favor high amputation with drainage. All cases require the thorough coöperation of the internist and the surgeon.

Shallow gives a very interesting account of osteitis fibrosa cystica. He believes that solitary cysts, multiple cysts, giant-cell tumors, and osteomalacia are varying manifestations of the same condition. The principal underlying etiologic factor in all cases is a hyperparathyroidism.

Temple Fay outlines his widely accepted treatment of head injuries in which he emphasizes the value of dehydration.

Among the other subjects ably discussed are conservative renal surgery, aspiration for hemiarthrosis of the knee, varicose veins, intraäbdominal cysts, splenectomy, torsion of the omentum, thyroiditis, extrapleural thoracoplasty, mixed tumors of the kidneys, malignant tumors of the small intestine, and diverticulum of the stomach.

Surgical Pathology of the Skin, Fascia, Muscles, Tendons, Blood and Lymph Vessels. By ARTHUR E. HERTZLER, M.D. 291 Pages plus Index. Illustrated. J. B. Lippincott Co., Philadelphia. Price $5.00.

This volume is one of a series of ten monographs on Surgical Pathology written or in preparation by the author. Such an ambitious project would suggest an encyclopedic handling of the knowledge available in this important field. Examination of this volume does not confirm the suggestion. There are numerous extensive omissions in the text, more numerous and extensive omissions in the index, and reference to the literature is scant and suggestive, rather than thorough. As a result of these defects, the book is not so much a work of reference as the recorded experience of one worker. The main advantage of these omissions is a small compact volume written in readable style without interruptions for footnotes.

In regard to the textual omissions, there is no mention of the phenomena of normal healing of wounds. The pathology of burns, phenol gangrene, contusions, etc., receives no attention. Another important allied omission is an account of the phenomena in the tissues associated with surgical manoeuvres, such as the absorption of sutures, growth of skin grafts, tendon sutures, fascial grafts, reactions of veins to sclerosing injections, etc. The fact that most textbooks of surgery deal with these subjects makes them no less a part of the general field of surgical pathology.

A short chapter deals with chronic ulcers of the skin, but infections such as erysipelas, furuncle, carbuncle, anthrax, etc., are not mentioned.

Chapters dealing with benign and malignant tumors of the skin are excellent, and illustrated with a wealth of photographs and photomicrographs. It is obvious that the author is intrigued with the neurogenic theories in regard to melanomas and lipomas. References to the literature of these theories is adequate, but a brief résumé of some of the data on which they are based would have been welcome. In general the author contents himself with stating his own view, and alluding to controversial points, rather than attempting to debate the merits of theories.

The chapters dealing with diseases of fascia, muscles, tendons, and vessels are adequate and well-written. Each condition is described briefly, followed by paragraphs on pathogenesis, pathology, and histology. The author writes with facility and felicity. The usefulness of his book for reference would be much enhanced if the index could direct to all the material available in the text.

Peptic Ulcer—A Symposium of the Current Literature. The Bisodol Company, New Haven, Connecticut.

This little volume of about eighty pages offers little of interest or value to the man who is really interested in the subject of peptic ulcer. To the casual reader the material is so presented as to make available the opinions of various writers in this subject. Etiology, diagnosis, treatment, including a résumé of the classical forms of therapy, and a bibliography are covered more or less completely. The unfortunate part of the entire presentation is that there is no attempt at an evaluation of the various opinions which are presented, many of which are divergent or contradictory. The brochure is a clever bit of advertising but does not represent a contribution of any importance to medical literature.

A Doctor of the 1870's and '80's. By WILLIAM ALLEN PUSEY, M.D. Charles C. Thomas, Springfield, Ill. Price $3.00.

This biography of Dr. Robert B. Pusey of Elizabethtown, Ky., is an extremely interesting and intimate human document, not only portraying, as it does, the life of a representative country practitioner in the decades prior to 1890, but also presenting the personal biography of a father by his son, likewise a physician of eminence. Written with loving devotion and detail, this account errs neither in the direction of biassed admiration, nor of self-depreciation. It presents, therefore, not only the picture of the typical and attractive personality of the country doctor of the past century but the revelation of a just and deserved tribute from one generation of our esoteric profession to its predecessor. This book is a very worthy contribution to our growing library of illuminating medical biography.